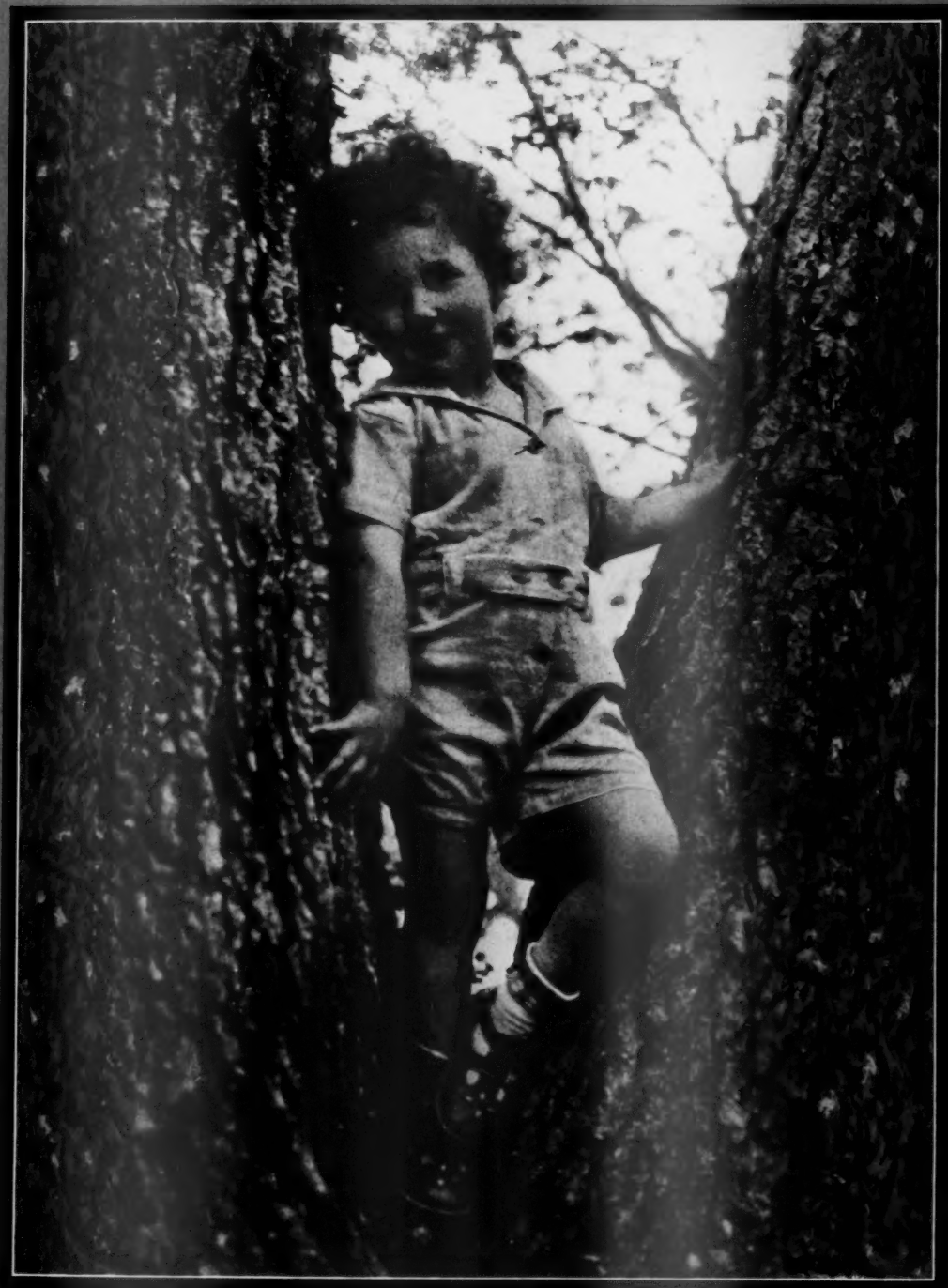


American **FORESTS**



AUGUST 1931

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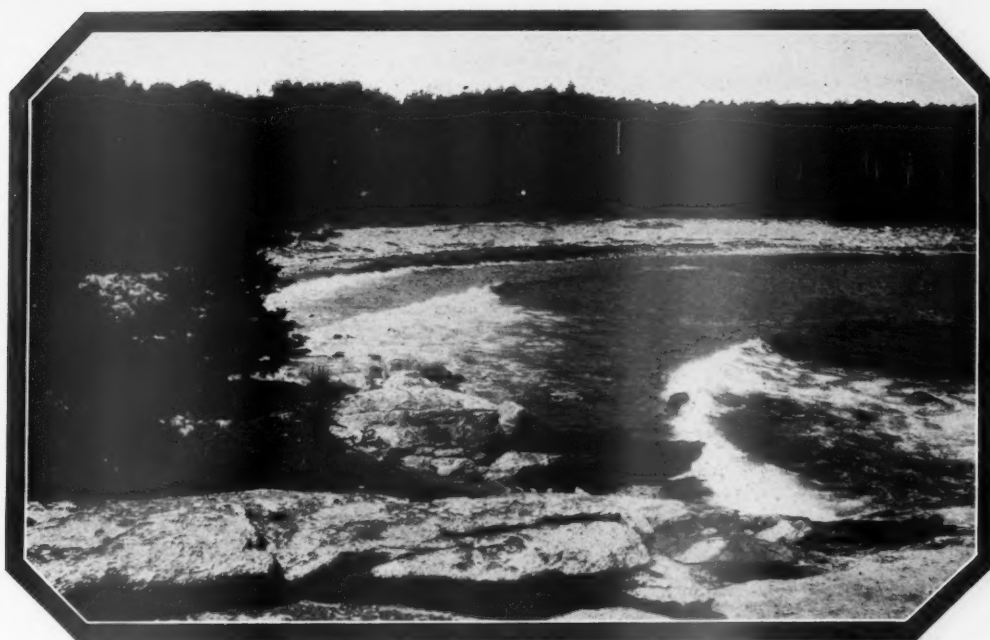
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Photograph by Lindsay

"ON THE WOODED SHORES O' MAINE."

AMERICAN FORESTS

OVID BUTLER, Editor

L. M. CROMELIN and ERLE KAUFFMAN, Assistant Editors

Published Monthly—35 cents a copy—\$4.00 a year

1727 K Street Northwest
WASHINGTON, D. C.

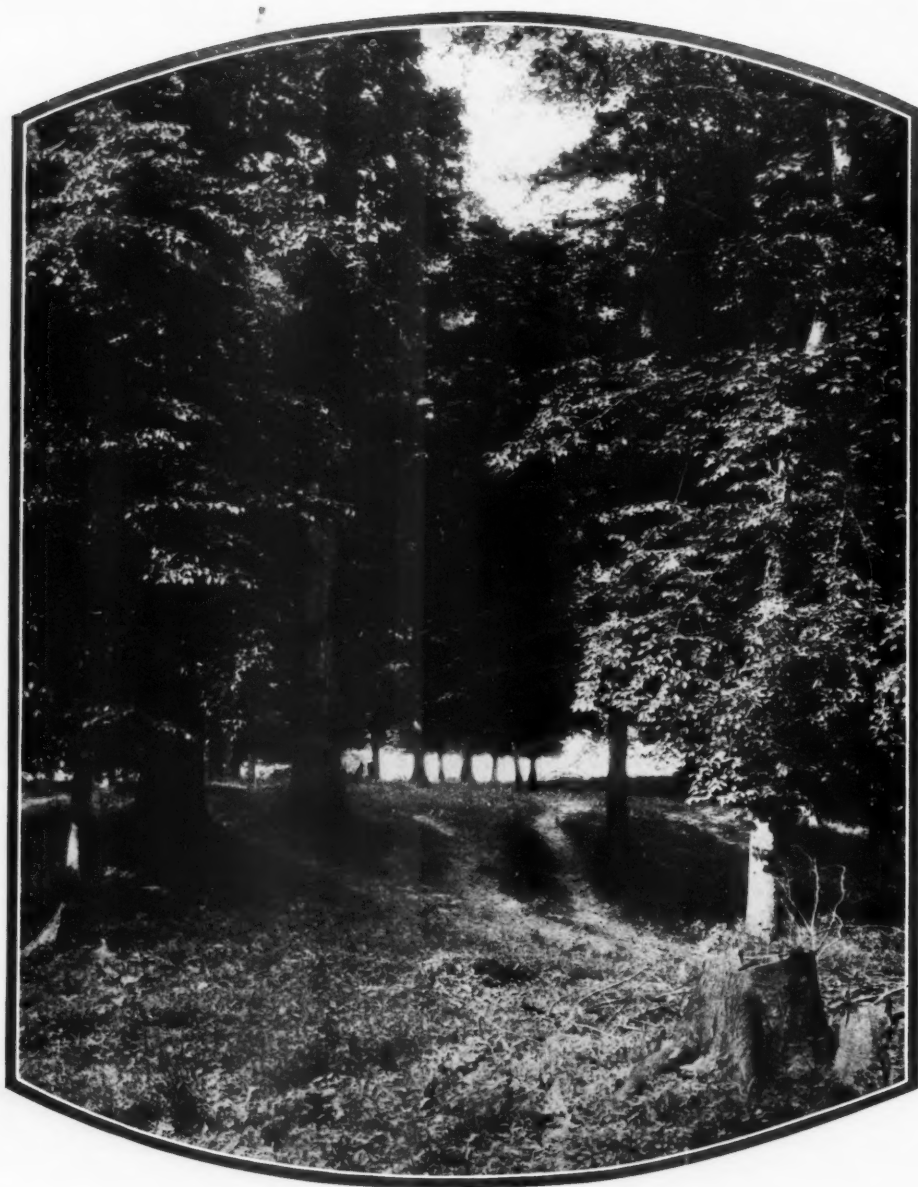
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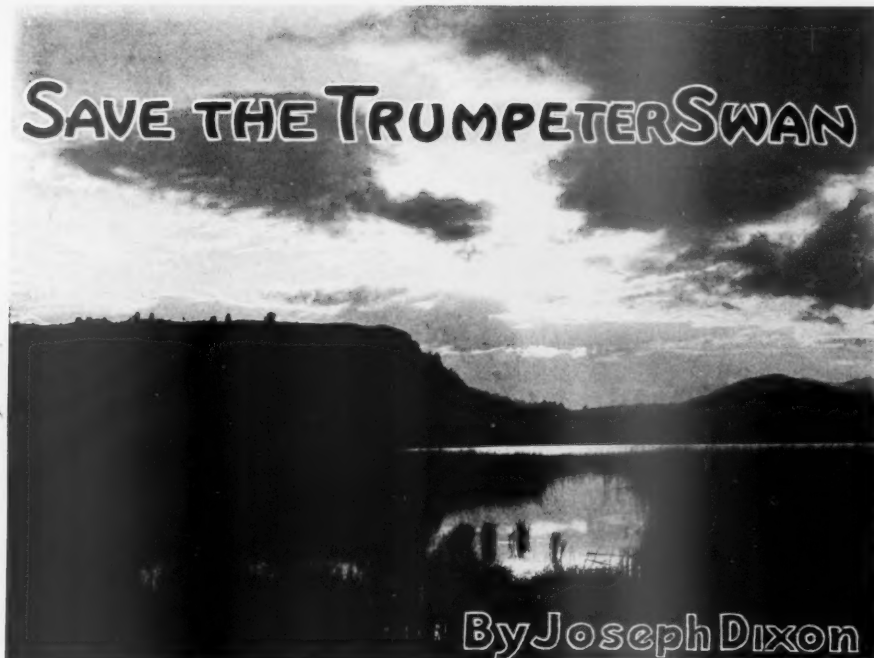
TEMPLE OF THE WOODS

I know a place where sunlight falls
Like moonbeams through the trees,
A woods that lifts its towering walls
Against the vagrant breeze.

There, in that cloistered spot, I've learned
God is not far away.
Each bough is bent, each leaf upturned—
The forest seems to pray.

—Walter E. Jenney.

SAVE THE TRUMPETER SWAN



The quiet reaches of Trumpeter Lake, where the swans nest.

IN WHICH THE AUTHOR, WITH NOTE BOOK AND CAMERA, SUCCEEDS IN OBTAINING AN INTIMATE AND DELIGHTFUL STORY OF THE FAMILY LIFE OF THIS RARE AND VANISHING BIRD

ONE of the first outstanding problems that confronted the survey of animal problems in the National Parks, inaugurated in July, 1929, was that of the vanishing trumpeter swan, *Cygnus buccinator*. This largest living species of North American waterfowl has been slowly but relentlessly driven back before the advance of civilization in the West until at present only a few pairs of breeding birds are left in the United States, and these are restricted to a limited area in the Yellowstone region. A. C. Bent, in his recent monograph, *Life Histories of North American Wild Fowl*, states, "but now it probably does not breed anywhere within the limits of the United States, except possibly in some of the wilder portions of Montana or Wyoming."

Trumpeter swans have been protected in the Yellowstone region along with the pronghorned antelope, the grizzly bear, the American bison, and other outstanding species that have been threatened with extermination elsewhere. However, unlike the bear and the bison, the swan has not come back, but instead has slowly but surely become less and less numerous.

America's native swans, both whistling and trumpeter, have been given protection by international, federal and state game laws, so that there is at

present no open season on these birds. In spite of this fact a number of these magnificent birds are shot down each year by ignorant or careless hunters. The actual number killed is impossible to determine because the hunter who shoots through ignorance will leave the swan right where it fell or throw it away in order that there be no incriminating evidence should a game warden be encountered. It is hoped that this article will be one means of calling the attention of hunters and other outdoorsmen to the seriousness of the situation and to the great need of giving full and adequate protection to the trumpeter swan at this critical time.

In order to determine the actual present status of the trumpeter swan, I made a preliminary investigation in the

Yellowstone National Park region during the fall of 1929. I found considerable difference of opinion expressed regarding the number of trumpeter swans that existed in the park. Investigation proved that most of the difference of opinion was directly traceable to confusion between the whistling swan and the trumpeter swan. The whistling bird is the smaller of the two North American species and breeds in the Arctic region of northern Alaska and Canada, while the larger trumpeter swan, which has a much deeper voice, is a



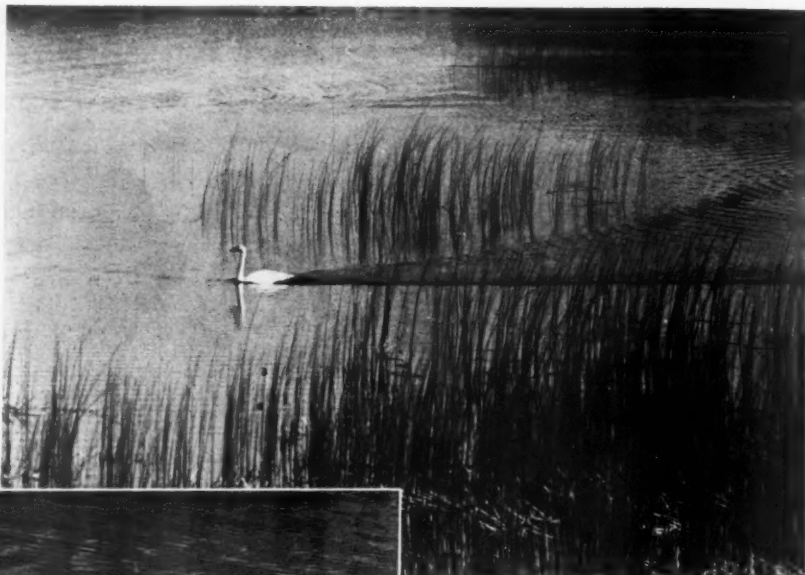
When the cygnets were twenty-four hours old, the whole family swam away from the nest, but returned to it each night to roost.

southern species that formerly bred in the United States at suitable localities over much of the northern portion of the Great Basin and Mississippi Valley as well as in the adjacent southern provinces of Canada. The birds which remain throughout the summer and breed in that region are trumpeter swans but hundreds of whistling swans pass through Yellowstone each year during both the spring and fall migrations. It thus happens that during mild seasons whistling swans, while on their southern migration, frequently remain in the Yellowstone until driven on southward by severe weather. At such times both whistling and trumpeter swans occur in mixed flocks. During the first week of December, 1929, just before the freeze-up, a flock of ninety-nine swans was reported from the smaller arms of Yellowstone Lake. However, the ranger making the report was unable to say how many were whistling and how many were trumpeter swans.

For these reasons it is obvious that the proper time to take the trumpeter swan census in Yellowstone is not in the late fall or early winter but rather in June, at which time the whistling swans

never hatched. While no conclusive evidence was obtained, it was definitely established at that time that the birds had nested and the eggs had been laid each season.

After investigating all available data, it was agreed that it was high time that special attention be given to this problem. Consequently, early in June, 1930, with George M. Wright, of the National Park Service, I arrived at the little lake, known locally as Trumpeter Lake, where I had found



The mother with her precious brood of downy young, swam hastily back to the shelter of the tules.

have all gone to their breeding grounds in the far north.

During my preliminary investigation, I found that a pair of trumpeter swans had nested each season for the past five years in a little lake near Junction Butte on the Lamar River, not far from the buffalo ranch. Although a close watch had been kept of this pair of swans, they had never been known to produce a single offspring during the entire five-year period. I made every effort to ascertain the real cause of this failure but details could not be obtained at that time. Some men thought that coyotes caught the young, others suggested that eagles may have been guilty. One man suggested that the eggs might be infertile and therefore had

The instant I launched my boat, the father swan began to trumpet—a resonant, loud warning note. Then he swam boldly out to meet me, in an effort to divert the intruder's attention from his family.

the pair of swans the previous September. The lake is not much larger than a forty-acre field, and is located near the center of the summer range of the pronghorned antelope in the lower Lamar River valley. It is encircled by rolling sagebrush-covered hills. The general region is dry and the life zone is Arid Transition. Isolated clumps of aspen mark an occasional seepage place in some of the draws, while a few scattering lodgepole pines grow along the higher portions of the adjoining ridges.

Our visit proved to be most timely, and we located the nest fifteen minutes after our arrival. From previous ex-

perience in Alaska, I knew the location wild swans prefer for a nesting site. Therefore, I expected that the nest would be located on one of the small tule-screened islets that stood well out in the lake where the brooding mother swan and her precious eggs would be safe from the attacks of four-footed predatory land mammals.

It was after five o'clock in the evening when I crept cautiously through the stunted sagebrush that grew on the ridge half a mile from the lake. At first I could see no swans. However, a second glance through the binoculars revealed a large white bird partly hidden in a patch of dead tules. This proved to be the male, and a further search revealed his

mate sitting on a "haycock" of dead tules. The main structure of the nest consisted entirely of dead tules that had been built up until a mound seven feet long, six and one-half feet wide, and extending thirty inches above the water, had been accumulated. The nest was placed in shallow water which we subsequently found to be slightly more than knee deep, and was well protected on two sides from the strong winds which blew daily up the canyon.

Because the shyness of these particular swans was known, we decided to carry on our observations at a distance so as to leave the birds completely undisturbed and perfectly natural. I chose as my hiding place a large boulder that stood on the open hillside 200 yards from the nest and overlooking it. This boulder could be reached from camp without the swans seeing me.

While my companions, George Wright and Ben Thompson, went to investigate the status of another pair of swans, I spent my entire time watching and recording with notebook and camera the details of the everyday life of this pair. For three days and nights I camped behind the boulder on the hillside. Fortune favored me, for during those three days I was permitted to witness the hatching of the eggs and to observe and to record the undisturbed home life of the swans, together with many details of the care of the newly hatched downy young. In short, I was able to realize in part the very wish that Vernon Bailey, Chief Naturalist of the Biological Survey, had expressed in his chapter on the trumpeter swan in his book, *Animal Life of Yellowstone National Park*, when he said, "What better service could a competent ornithologist render the country at large than to spend a summer or several summers quietly watching these birds night and day to learn more fully their habits and needs?"

At eight o'clock on the morning of June 9, 1930, the female swan left her nest after having covered the eggs carefully with dead, rotten tules. She swam directly to the feeding ground about 100 feet away. As soon as his mate left the nest the male swam up and took over the duties of watching, remaining constantly within fifty feet of the nest. However, when a marauding raven came circling around it was the female that spied it first, and she immediately rushed back to the nest in order to protect her eggs. It was found that this was the normal procedure for the incubating female. As soon as the sun was well up, she covered her eggs and left the nest in care of the male, which remained close by but was never seen to incubate the eggs.



One—extremely self-reliant—tried to escape by going ashore and hiding in the grass, but it was too short to conceal him.

An hour later the female returned to her nest, waddled slowly up on it, and then paused and looked directly at the eggs to see that they were well covered. Then she swam away again to complete her breakfast. In seven minutes the male swam toward the nest but before he had reached it the female came flying in, scooting along on the water. Then with wings partly lifted and with necks held close to each other, the two swans went slowly up and together inspected the

nest. This picture of the pure white birds floating on the blue water and outlined by the dark green of the tules will always remain in my memory as one of the most beautiful pictures I have ever seen in nature.

Shortly after five o'clock on the morning of June 10, the female was on her nest where she remained quietly during the rest of the early morning. At 6:48 the male retired to his favorite preening and sunning spot, which was located on a little strip of sandy shore of the islet about forty feet from the nest. After preening and dressing his flight and tail feathers he swam over to the nest. This was the first time in two days that I had seen the male go ashore.

The female reached her long neck over the side of the nest at seven o'clock and dipped her bill into the water of the lake. She then elevated her head and slowly swallowed the water. At 7:54, while still sitting on the nest, she again drank three times in two minutes by the watch. At 8:20 the brooding female reached her head back between her wing and body and probed around, apparently turning one of the eggs over with her bill. As she withdrew her bill there was a white object noticeable between her black mandibles. With the aid of the binoculars I decided the bit of white was the inner surface of a large piece of eggshell. Soon the mother again probed vigorously under her wing with her bill, apparently helping to break the shell of the last egg, because a few moments later, when she stood up, I saw beneath her four downy white cygnets, each about the size of a teal duck. Two other cygnets, still wet and apparently just out of the shell, could barely be distinguished. The last egg hatched exactly at 8:20 on the 10th day of June.

The male swan seemed to realize that a critical moment in his family life had arrived and remained nearer than usual to the nest. While the eggs were hatching, a pair of coots and two pied-billed grebes swam about and fed within forty feet of the swans' nest, undisturbed. A male yellow-headed blackbird perched on the tip of a tule slightly above and about six feet from the mother and her brood. Both swans, however, seemed to realize that these birds were harmless and they made no effort to molest or to drive them away.

At 9:20 o'clock the female swan stood up, fluffed her feathers and shook her body gently. The cygnets then squirmed and crawled about the nest in a reptilian manner, their bodies held prone, sliding forward over the dead tules, being propelled by alternate strokes of their large but wobbly legs. The mother held her body prone on the nest, the cygnets partly tucked under her spread wings. Then she



Already the cygnets were showing their independence. In attempting to elude me, two of them stayed quietly alone in a dark pocket in the tules.

stood up, giving the warm sun a chance to dry out the white fluff down of the young swans. The cygnets continued to crawl about. One of them got directly under its mother's breast, whereupon she took her bill and pushed it gently backward, rolling it over and over out under her tail. She then continued to fluff out and preen the fluff down of the cygnets with her huge black bill. At 9:30 the male returned to the nest and proudly inspected the young, then swam off and started feeding.

At 9:45 a raven flew near and circled about fifty feet above the nest. The mother swan hurriedly gathered her cygnets under her wings and squatted upon them, keeping them closely covered. No alarm note was uttered, but as soon as the raven appeared the male rushed to the nest and was on guard the rest of the morning. For the next two hours the female brooded her young on the nest, changing her position every half hour. At 12:36 o'clock I saw two of the cygnets crawl out from under their mother's half-spread wings. After scrambling about for two minutes, both tried to climb up on their mother's back but they kept sliding off. At 1:30 in the afternoon a muskrat swam out, apparently from beneath the swan's nest. He continued to swim about for several minutes, but the birds paid not the slightest attention to him.

Shortly afterwards two pairs of ravens swooped down, one after the other, upon the nest, but both of the swans were present. Although the ravens circled about several times during the next hour, they were driven off each time they approached to within ten feet of the nest.

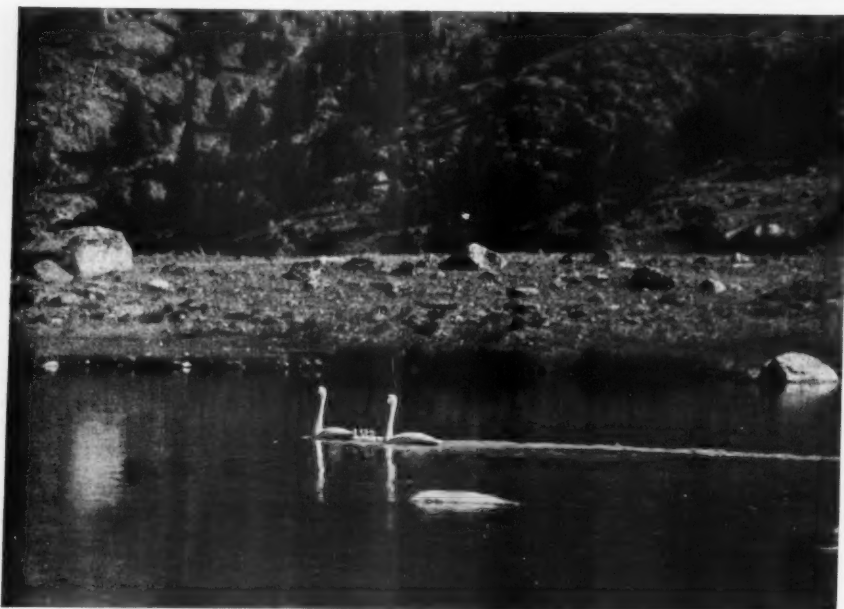
The pair of swans which Mr. Wright and Mr. Thompson watched at Tern Lake on June 11, 1930, were not successful in driving off the marauding ravens, for when the mother left to feed, a raven appeared and was observed to fly directly to the nest. A pair of blackbirds made a valiant effort to drive the marauder away, but the raven struggled doggedly on and finally lit on the edge of the swans' nest. Mr. Wright recorded in his notebook what took place, as follows: "At first the raven just poked about in the nest with its beak. It gave four or five vehement strokes, its whole body jerking with each movement. It then put its head down for a second, and after a moment looked up in the direction of the swans out in the lake. Just at this moment Mr. Thompson, who was watching the swans, reported that they were both flying to the nest. The raven saw this. It stuck its head down once more and pulled from an egg in the nest a long pink-and-

whitish object, apparently an embryo from one of the swan eggs, and started to fly away with it just as the parent swans rushed back and drove it away from the nest."

I had watched ravens raid, eat and destroy the eggs of numerous yellow-headed blackbirds, coots and other inoffensive birds that nested in the lake along with the trumpeter swans. In order to make sure what this particular pair was feeding its young, I located and visited their nest on Specimen Ridge about one and one-half miles away. While I stood watching one of the parent ravens came flying in carrying in its bill a downy young coot which was still struggling and immediately fed it to the hungry young ravens. As a matter of fact, investigations showed that this pair of ravens

raised their own young on the eggs and helpless young of smaller species of birds that nested at Trumpeter Lake. In view of these known depredations and the subsequent grave danger to the young swans, I used a shotgun on them the next time that they visited the lake and attempted to carry off one of the downy young swans.

The ravens at Trumpeter Lake had obtained a supplemental food supply from the refuse that had been thrown



To guard against vicious aerial attacks of ravens and hawks, the parent swans gathered the cygnets together and kept them in between them. One might call it "protective formation"—but it was a remarkably beautiful picture of wild life, *en famille*.

out on the garbage dump at the buffalo ranch when bison and other animals were killed. During the severe part of the winter, when nature would naturally have restricted the number of ravens through starvation, man had unintentionally assisted by providing a food supply so that, instead of starving, the ravens had prospered and increased. At the same time the swans have suffered a continuous decimation at the hand of man, especially when they have come in contact with hunters outside of the National Park. It is obvious that under natural conditions ravens and river otters might take a small annual toll from the swans without seriously endangering them, but if given continued protection and, in the case of ravens, an additional food supply, they might easily be the means of exterminating the swans. A general campaign of control of ravens or other enemies of the swans throughout the park would not only be desirable, but it is absolutely necessary, if the swans are to survive, to restrict the number of ravens or other enemies in the vicinity where swans nest.

At 4:57 in the afternoon of June 10 the mother swan stood up on her nest, fluffed her wings, and then slowly settled down again. A moment later she slid gently into the water and, while swimming slowly, called to the young to follow. The cygnets duplicated her action (*Continuing on page 478*)



SCENIC ALGOMA

A LITTLE-KNOWN LAND ON THE EDGE OF SUPERIOR

By F. A. MACDOUGALL

Who hath smelled wood smoke at twilight? Who hath heard the
birch log burning?
Who is quick to read the noises of the night?
Let him follow with the others, for the young men's feet are turning
To the camps of proved desire and known delight.

—Kipling.

ON THE east shores of Lake Superior, in Ontario, lies Algoma. Around this land, to the south, east and north flow great streams of tourist traffic. Up and down the St. Mary's River and through the Soo Locks pass a greater volume of tonnage than any canal in the world. On a clear day the fleets of freighters steaming over Superior resemble battleships on parade. Yet Algoma is unknown—even to Canadians.

This little-known land lies in the center of the American continent—where the Great Lakes first meet and divide again. Here lie the twin cities of Sault Ste. Marie, one American, one Canadian—so alike in interests that it has never occurred to either that its name should be changed. Within a radius of 500 miles are six of the greatest cities in North America. It is but a day's motor distance from Detroit, Chicago, or Toronto. Its very closeness to the heart

of civilization has bred indifference, for people go farther afield for solitude. Algonquin Park and Timagami, with organized tourist traffic, the French River with bass and pickerel, the Nipigon with its world-famous trout, remain the lodestones that attract the fisherman and the camper. Algoma remains a wilderness, unexplored save by a venturesome few. Here is a land where the great inland sea and

shore meet, where the rivers are found at the bottom of gorges hundreds of feet deep. Here speckled trout thrive in clear, cold water; here are thousands of square miles, unexplored and untraveled.

Here is a hardwood forest hundreds of miles north of its range—a hardy forest of maple and yellow birch. Encircling the east side of Superior, it depends upon the softening influence of the great lake for its existence. With the courtesy of nature it repays its debt by acting as a great reservoir



Indians on the Garden River—Algoma—unexplored and untraveled save by a venturesome few, remains a wilderness, where true solitude is to be found.



Perfectly named, from the train one glimpses Bridal Veil Falls in Agawa Canyon—the gorge of the Agawa River—cascading in pure white beauty over the cliffs to the river below.

to store, filter and purify the water that keeps Superior unchanged. Century after century through thousands of canyons and gorges, like a great network of arteries, it distributes water to Superior. Then the west wind, dry and strong, steals across the lake, gathers moisture and gently deposits it as mist, rain, or clouds on the hilltops to be purified and returned as water. On the hottest summer days the air is cool and moist in this northern hardwood forest.

Not for many miles east of Superior does any great fire scar mar this forest. On hilltops there are occasional small patches where

lightning fires have started and burned out; but, viewed from the air, the country from the Soo to Michipicoten Harbour, one hundred miles north, is carpeted with an

almost unbroken covering of spruce and balsam, birch and maple. It is a contrast in colors, the light green of the hills, the blackish green of the softwood, changing in autumn to colors more fantastic than the imagination can picture. An unbelievable sight that persists for weeks. A day in Algoma's fall woods rests and exhilarates the mind as nothing else can do.

Thirty years ago an industrialist came into this



A land of proved delight to the fisherman. Algoma combines river and lake scenery, rapids and still waters.

land and projected a railway line north from the Soo. In the short space of 150 miles this railway, the Algoma Central, gives not only a cross-section of Algoma, but a close-up of some of its beauties. Four miles north of the Soo, it climbs up onto a high plateau. Millions of years ago this was a great mountain range as high as the Rockies, encircling Hudson's Bay like a horseshoe. For countless ages it has been scoured away. Now it is called the Laurentian Shield. It is just a rocky plateau covered by a thin layer of boulder clay with deep, gravel-filled valleys. On the slopes of these once great mountains are storehouses of gold, silver, copper and nickel. For two hundred miles the railway climbs up and down over this range from one watershed to another, crossing ten great river valleys, each with its own strange scenery.

At mile 92 the train runs swiftly along a side hill. To the right, across the valley, is a great cliff. Of a sudden the train shoots out across the valley onto a great iron trestle, one hundred feet high. To the right one looks up the Montreal River over a lakelike expanse of water into purple hills; to the left one gazes into a deep

gorge three hundred feet below the track; and leaning out of the windows, one sees right under the train a great waterfall, eighty feet high. A second's dizziness gazing into the depths and the train is across and the view is hidden—a picture that will never be forgotten.

At mile 103 the train winds slowly out of a cut onto horseshoe fill. Amid the sudden silence that comes when a train is up high and unhemmed, the beauties of Superior appear nine hundred feet below and four miles away. Agawa Bay encircles the vast blue of the lake and the hills north of the Agawa Canyon come into view. A few minutes pass and swiftly the train slides down into the Agawa Canyon—the gorge of the Agawa River. Through walls of rock six hundred feet high the river has cut its way for twenty miles, and beside it at the foot of the great cliff runs the railway. Few sights in Algoma compare with the grim beauty of the canyon. In eight miles the railway creeps down the walls to the river bed. It takes another twenty to climb upstream and out the north end and on to Sand Lake, Anjigami Lake, and the Canadian Pacific Railway. Then north to Hearst,



A short train trip gives one not only a cross-section of Algoma—this little-traveled land where the great inland sea and shore meet, but also a close-up of much of its beauty. Speckled trout thrive in clear, cold water in rivers at the bottom of the great gorges. Climbing up and down, from one watershed to another, the train crosses ten beautiful river valleys. Suddenly shooting out onto a great iron trestle—one hundred feet below lie the shimmering waters of the Montreal River, startling in its beauty, never to be forgotten.

if one wishes, over the height of land across three continental railways and through the edge of the clay belt—the rich clay lands that once were the bottom of Lake Ojibway, a mighty lake of long ago. This is the farmland of northern Ontario.

One who looks at the canyon walls can visualize the real nature of Algoma. Deep valleys, long hardwood slopes,

miles east the river flows through an unlogged country. Great cliffs hem in the river valley. First, a lakelike expanse of water ten miles long, then a fast, meandering stream crossing and recrossing a wide river valley hemmed in by rocky cliffs. On the entire thirty miles there are only two short portages, the longest being twenty-five chains, then on to Tikamaganda, or Chapleau, as fancy or time dictates.



The lakelike expanse of the Montreal River at mile 92, and in the distance the purple hills beckon to the traveler—What lies beyond?

abrupt, conifer-covered cliffs—a mountain region in eastern Canada. It looks hard to travel but only by traveling can one see the real Algoma. The land is safely hidden from the casual, but to the real woods traveler it reveals its wonders of scenery, fish and game.

The modern traveler may wish to sit at his ease far up in the air and see Algoma by plane, swooping down to look at some beauty spot, flying low up long river valleys or landing at a sand beach on some unnamed inland lake. If so, he alone sees the long V-shaped mud trail in the lakes that denotes a moose wading out and if he looks closer at the apex the moose itself is seen feeding on lily pads. He alone sees the mists creeping in from Lake Superior in early morn and rising over the hills, forming little cumulous clouds that float away inland. He alone sees the magic carpet of autumn woods covering thousands of square miles.

Or the modern traveler may be a boatsman and cruise along Superior shores idly resting, or landing to fish at some river. One can imagine him looking into the great hills and wondering what lies among them and beyond; perhaps regretting that life's business worries prevent him from exploring.

He may be a fisherman or a canoeist trying to cram into his short holiday enough memories of hardship to refresh the mind and revive the body for another year; and enough of solitude to rest the nerves. If so, he will launch his canoe on some inland river and pass from view around a bend into rest and quiet and meals cooked over the open fire. He can go by many routes—the Montreal River, the Sand River and the Mississagi River.

At mile 93 he starts up the Montreal River. For thirty

There is only one bad feature to this trip—the Montreal is not a trout stream.

From Sand lake, mile 138, one can journey quickly down a swift trout stream fifty-five miles over many portages to Lake Superior. It is a trip that gives a combination of river and lake scenery, of rapids and still waters. A sensation never forgotten is to come out over the last portage and, warm with packing, suddenly enter the cool, fresh bank of air off Superior. And then see Superior itself, perhaps calm and peaceful under a hot August sun, or a terrifying turmoil of waters in a September storm.

And so the summer passes, the cool fall days pass into Indian summer and the little ponds freeze over. Dull clouds gather from the northwest and winter with its crisp, fresh beauty brings another change of scenery and traveling conditions. Now when you go into the woods the swish of snowshoes, like sandpaper on wood, makes a pleasant rhythm to break the deadly silence. The impassable swamps of summer become the first order of trails. All shrubbery is covered in four feet of snow and when it is packed one makes amazing speed in most any direction. Trappers lay out their lines. Logging makes the silent valleys in the white pine country resound with life.

Then, while winter seems still to hold a firm grip on the land, suddenly in the woods a strange sight strikes the eye. The drabness of the leafless forest has gone. The birch forest on the west slopes where the setting sun strikes it glows with the color of old rose. The birch buds are swelling, billions of them joining to change the color of the forest. It is the first visible sign of the break-up, flooded brooks and trout fishing.

The Lumber Industry Stands at Bay

Hard Driven by Idle Capacity, Overproduction and Mounting Carrying Charges on Timber Reserves, Its Outlook Is Ominous

By WILSON COMPTON

THE condition of the timber and lumber industries is perilous; in fact, it is ominous.

In timber ownerships and the timber and lumber industries ten billion dollars are invested, and they ordinarily furnish employment to hundreds of thousands of men in regions which offer no other industrial employment. The lumber industry has been in depression during much of the past decade, the present crisis being only an accentuation of its particular troubles by the general depression. Lumber stocks are excessive and yet lumber operations are fifty per cent less than in 1929, with the result that 150,000 men are out of work. Lumber production and consumption are at the lowest level in half a century. At no time in the last decade has lumber production been as much as sixty per cent of the installed capacity.

This overcapacity has resulted in heavy and nearly continuous overproduction. The 1929 census determined the production of 1,167 sawmills which cut over five billion feet annually, as over twenty-six billion feet, or seventy per cent of the total cut of thirty-six billion feet. These mills—about six per cent of the total—could readily have produced more lumber than the total consumption of the United States in that year.

Lumber prices of some of the principal species are today about where they were a quarter of a century ago. The average wholesale price for all species was \$16.54 a thousand feet in 1906 and \$22 in 1930, with almost continuous further declines since the middle of last year. During the past two years

This article by Wilson Compton is the first of a series picturing present-day conditions confronting our greatest forestry industry—lumbering—as told by men within the industry. Mr. Compton's article describes the general situation prevailing within the industry as a whole. Next month William B. Greeley, Secretary-Manager of the West Coast Lumbermen's Association, will present his analysis of conditions that have rendered the industry prostrate in Washington and Oregon. His article will be followed by one by Mr. Henry Hardtner, dealing with the southern pine situation. The fourth article, by Mr. C. Arthur Bruce, will give the essential facts of the situation facing the hardwood industry.

The information contained in these articles has been laid before President Hoover's Timber Conservation Board to aid it in its consideration of the problems and consequences of overproduction in the forest industries and in its efforts to find constructive remedies. The situation as presented by the industry's spokesmen, however, is of such moment to public interests and to orderly conservation of our forest resources that the leaders mentioned in the preceding paragraph were asked to present their respective views in special articles for the information of the public.—Editor.

feet. This decline is attributed in part to changing styles, customs and industrial and housing standards and, in a large part at the moment, to the fact that residential building is only a third that of three years ago.

TIMBER SUPPLY

Present and prospective timber supply and present and prospective timber needs have been a prolific source of controversy for nearly half a century. The present generation in America has been periodically warned of imminent "timber famine" and "timber shortage." The purpose of these predictions has been almost uniformly sincere, constructive and courageous. In some important respects, however, their cumulative effect has become destructive of their very purpose. The succession of published official estimates of national timber stand for the past half century has been in part as follows:

1880..	856 billion ft.
1896..	2,300 billion ft.
1900..	1,390 billion ft.
1905..	1,088 billion ft.
1911..	2,826 billion ft.
1917..	2,700 billion ft.
1920..	2,215 billion ft.

In 1880 the late Senator Hale, of Maine, predicted that within forty years thereafter Maine would be barren of timber.



A typical sawmill plant and lumber town. There are thousands of such communities in the United States which have been suffering from lack of lumber markets for many years. There are now 150,000 men out of work in the lumber industry, according to Mr. Compton.

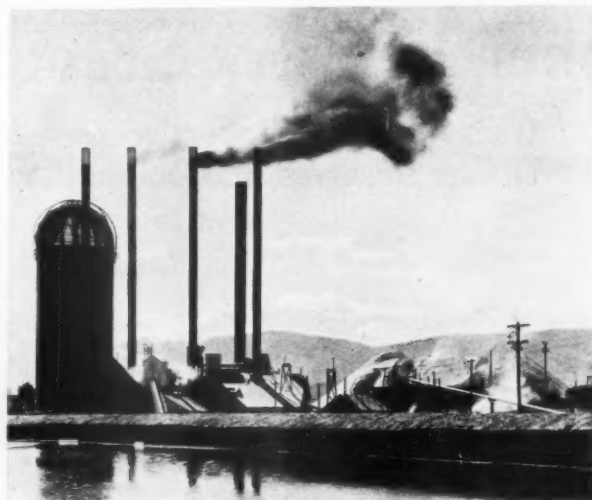
At that time the estimate of timber stand in Maine was about six billion feet. Since then Maine has cut nearly forty-four billion feet of lumber and has a timber stand officially estimated at about thirty-five billion feet. New England forests generally are now competently reported as growing more timber than is being currently utilized (although of course not as much as is being currently consumed in New England).

A quarter century ago there were repeated and dramatic forecasts of a timberless America within thirty years. Perhaps the most noteworthy result of that stream of publicity was to inspire a furious and—as it has turned out—an untimely and unwarranted speculation in western timber. Thousands on thousands of persons financially of high and of low degree bought small tracts and large tracts of timber, much of it “sight unseen.” Much of it in isolated small holdings in the mountains of the Pacific Coast is worth less today than when it was bought. With the taxes and carrying charges, thousands of these properties represent a net and in some instances a total loss to the investor.

Again in 1919 official and unofficial forecasts predicted that within ten years the southern pine lumber production would have declined from thirty to fifty per cent. Ten years later the production of southern pine had declined ten per cent, to about twelve billion feet annually.

STANDING TIMBER ESTIMATE

According to present admitted estimates of timber stand and of lumber cutting for the five-year period from 1925 to 1929, the timber supply of Washington is sufficient for thirty-five years, Oregon ninety-one years, California 141 years, Louisiana twenty-two years, and Mississippi twenty-six years. This is without allowance for the extensive new growth of timber, particularly in the western for-



The physical waste in the lumber industry is large, owing to a lack of byproduct outlets. Ordinarily, not more than sixty per cent of a log can be converted into lumber. Sawdust and slabs are used for power fuel or other inferior use. The burner shown on the left consumes enormous quantities of wood in order to get rid of it.

ests. Moreover—being merely arithmetical—it does not make allowance for the extent to which some of this timber is economically inaccessible. These are the five leading states in lumber production, representing one-half of the total lumber production of the United States.

Even within the last decade there have been official and semiofficial proclamations of “imminent pinch” of timber scarcity, and of prospective high lumber prices. These and similar statements, sincerely intended as a stimulus to forest conservation, have been exploited, amplified and exaggerated by other industries seeking to secure the substitution of other materials for wood, and have in fact gone far toward defeating the very purposes they were intended to foster.

I well understand that this bare recital of occasional incidents in the last half century's history of timber supply, conservation publicity and public understanding of forest facts does by no means tell the entire story. Nor in mentioning them am I trying to prove anything except that the succession of forecasts during the past half century have been for the most part inaccurate as to present fact; unsound as to future implications; and correspondingly harmful.

I suggest that these facts, and many others which might as well have been cited, may indicate the timeliness, the wisdom and the probable constructive value of a complete and impartial reexamination of the facts with respect to present and prospective timber supply and present and prospective timber needs.

I do not believe that anything but good will result from a public understanding of the great difference between adequate permanent lumber supply and adequate permanent forests. Lumber supply is only one—probably the most important—of the important purposes of forests. It is readily possible to have an ample national lumber



This shows what happens when fires are kept out—natural Douglas fir reproduction in the Pacific Northwest. Lumbermen say that the pressing problem of the lumber industry is one of too much timber, whatever the future may hold. Future commercial forest growing depends largely on proper conversion of present standing timber.

supply without having solved the important forest problems of maximum productive land use and the protective, recreational, spiritual and other values of forest growth. The two have been unwisely and harmfully confused.

NATIONAL MISJUDGMENT OF TIMBER SUPPLY

National misjudgment of timber supply prospects early in this century encouraged private timber investment, particularly in the West, on too large a scale. Dramatic timber famine publicity a quarter of a century ago was a large contributory cause. Again, the accumulated effect during the past three decades of repeated public warnings of timber famine, timber shortage and the "imminent pinch" of high prices has been one of the great factors in encouraging the substitution of other materials for lumber and wood products. Much of this displacement of lumber has been because of the clear superiority of other materials. Such substitution is sound, constructive, and should be permanent. But there is reason to believe that much of it also has been due to unfounded anxieties over the continued availability of suitable lumber supply, unwarranted fears of prohibitive lumber prices, and a vague but potent undercurrent of public impression, fanned by

zealous competitors, that it is rather a patriotic duty to aid forest conservation by refraining from the use of forest products. Abandonment of the use of lumber for these reasons is unsound and should not be encouraged.

I am prompted, therefore, to believe that public agencies, the forest industries and the foresters alike may willingly unite in a deliberate reappraisal of national timber supply and timber needs in terms of present facts, unbiased and unfettered by previous pronouncements. This is fundamental. We have all been wrong. We are all paying the penalty. We will all be better off if we will together make a fresh start.

Until the last decade the principal financial motive power in the lumber industry has been the appreciation in value of standing timber which often resulted in great fortunes. During the past several years values have become stagnant or have declined. The result is that vast timber holdings have become a financial burden on the lumber industry. The total privately owned saw timber is equivalent to about fifty years' reserve of raw material at the present cutting rate, whereas a twenty-year reserve, on the basis of present taxation, is all that a well-ordered enterprise can stand. This leaves a thirty-year supply that the lumber industry cannot

afford to carry, making it a business liability instead of an asset. Timber was worth on the average \$2.15 a thousand in 1900, \$6.15 in 1925, and \$5 in 1930. Meanwhile carrying charges have continued relentlessly. Taxes are generally by far the heaviest factor, creating pressure for premature liquidation, which has resulted in overproduction. The cost and market situation has caused an increase of the non-utilized portion of the timber tree by about twenty-five per cent, in the last three years; so that now not more than forty per cent of the raw material in standing timber is utilized.

The present volume of Russian lumber imports is relatively small; its promised future volume is colossal. Its importance to the American lumber industry is in four facts: first, Russia has the largest timber supply of any country in the world; second, timber is its most accessible and readily convertible

natural resource; third, the United States lumber market is the declared chief objective of the Russian export program; and fourth, nationalized timber, confiscated plants, forced labor, and state monopolies in production and distribution afford Russia great competitive advantages which are, properly, denied by law to American lumber manufacturers and distributors.

The remedy for unfair Russian competition may per-

haps be found in Section 337 of the present tariff law, which prohibits the importation of goods offered under unfair methods of competition. Under this section the President may suspend the importation of goods against which unfairness is charged, pending final determination of the question by the Tariff Commission. If the law should prove ineffective new legislation should be promptly enacted.

CONCLUSIONS

The facts that have been presented here point to five outstanding needs in practical timber conservation; viz, dependable control of lumber production, reduction in cost of carrying reserve timber, research, diversification of production and distribution of forest products, and protection against unfair competition, foreign and domestic.

These accomplishments are of course dependent primarily upon what the industry will do for itself. But much of it involves the exercise of public authority and cannot be done without it.

Temporary measures for relief are: (1) The withdrawal of Government and Indian timber from further unnecessary sale (which has now been done); (Continuing on page 509)



Miles of lumber—some American mills have a capacity of a million feet a day. The total capacity geared up to a prospective demand, that has not been realized, is about twice the present average annual production of thirty billion feet.

As a Cook Sees the Fire Trail

By J. J. MORRIS

THERE is one offense a man can never live down—that of being a cook. For seven years I traveled about the West and Alaska following this lowly life, finally forsaking it for the less remunerative but more home-like existence of a farmer. Yet I may as well have put a sign on my gate "Cook For Hire" and tattooed the word "cook" across my face. For if a man has ever cooked he will always do more or less cooking.

There is no dodging the job. In my own home or whether camping or picnicking, someone is sure to remind me that I know how to cook. Even in the Army a noncom shook me and said, "You're a cook." Long after the war was over, when I thought that the cook stigma would no longer follow me, who should pop into my house one smoky morning but a deputy fire warden.

"We've got a big fire over in the Ten-Mile Country," he said. "I would like you to go over there and cook for the boys."

My fall work was pretty well caught up so I went. The warden said there would be five or six men but I soon learned that five or six meant ten or fifteen. Not that wardens intend to deceive, understand, but it so often takes more men to control a fire than first appears necessary.

If anyone ever tells you that a man on the fire trail can eat just so much and no more, do not believe him. It is not true. Some men seem to be able to eat as long as they have time to eat; like Einstein's fourth dimension, time enters the equation and is the determining factor.

The forest fire itself is the big problem, which explains why the cook's problems are very much his own. He gathers his fuel, packs his water from wherever the nearest spring or creek happens to be, washes the dishes and cooks over an open campfire with sometimes nothing to cook and nothing to cook with. And he calls it all fun in the end.

The forest fires on the Oregon coast, of which I write, seldom crown. Rather they creep along the ground feeding on the moss, leaves and twigs that have accumulated under

the trees. At night when there is little breeze and some moisture in the air they smoulder along, covering only a few yards or rods. During the day they are fanned into a flame and cover considerable ground. At no time do they cease throwing off smoke and heat. It is next to this smoke and heat that trail diggers work.

The men who fight these fires work under a tremendous strain. They work day and night, in smoke and heat, and in constant danger of falling timber. If a man falls, exhausted or overcome by smoke, a man half his size gathers him up and hustles him out of danger. Or when axes and hoe-dads are flying by lantern light and a man gets a hand badly cut,

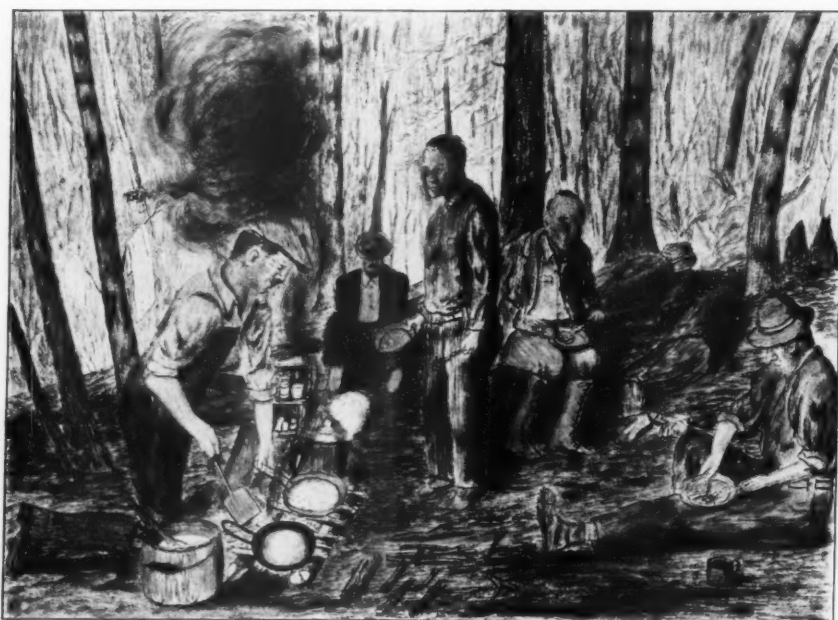
someone puts a cud of tobacco on it, ties it up in a handkerchief, and the victim carries lanterns the remainder of the night. It is no wonder that they have appetites.

Cooking on the fire trail means cooking reduced to its simplest and hardest form, for only such things can be served as can be cooked over an open fire. Stoves are hardly ever taken to a fire, for like gold, forest fires are where you find them, often miles from any road or trail and supplies

have to be packed in, sometimes on men's backs.

While no two fires or fire crews are exactly alike, the cook's job is very much the same for all. That is, as near as any adventures can be alike. I recall one Saturday night last August, when forest fires had been raging in different regions with no unusual excitement. I had just checked off of a fire that evening and, after getting shaved up, took the family to a show.

A strong breeze, almost a gale, was sweeping in from the sea. After the show I found a note in the car that read: "There is a big fire across the river on the Seven Devils Road. Be there by midnight if you can." A smokechaser has too much on his mind to go into detail with a cook. About the only thing a fire cook is sure of when he is called is that he will breathe a lot of smoke. Where he will pitch camp, where he will get water, how many he will have to



"If anyone ever tells you that a man on the fire trail can eat just so much and no more, do not believe him. Some men seem to be able to eat as long as they have time to eat; like Einstein's fourth dimension, time enters the equation and is the determining factor."

cook for are problems to be solved as he comes to them. Where he will sleep if he gets to sleep at all is quite certain—on the ground with an old blanket that he happens to have along for bedding.

I arrived at this particular fire about eleven o'clock. Twelve men had been fighting since sundown. A ten-man camp kit had been sent me. That meant that two men would drink coffee out of tin cans, stir it with a stick and do without plates and knives and forks.

A ten-man camp kit consists of one five-gallon flat-bottomed container in which is tightly packed three large kettles that fit one inside of the other, two stewpans, two large flat pans, ten tin plates, ten tin cups—usually one or two short—ten knives and forks and spoons, one butcher knife—always dull—one long-handled fork and three twelve-inch folding-handle frying pans. A yard or two of cheese cloth is supposed to be included, but somehow has a hard time getting in. It is not the intention to be stingy with the cook but to keep the camp kit as small and compact as possible so it can be moved quickly.

The fire that night was making such progress that we could not establish camp. I did, however, build a small fire and make coffee, to which I added cheese and bread. By morning there was a good trail in front of the fire but not clear around it, and seventeen—not twelve—hungry men staggered in for breakfast. Some of them had had nothing but the midnight

them in order. After a camp is established for a day the cook orders what he wants, but the first supplies are often put up by a tired smokechaser and a sleepy grocery man that has been pulled back to the store after hours. What they put up or don't



After the fire is out it's great to plunge into a stream and get rid of some of the soot, grime and dirt. These two are swimming upstream, against a strong current—and enjoying it.

put up may be laughable days after but when the cook faces the hungry men there is nothing funny about it.

Selecting provisions is not a part of a warden's training and as I said before the cook's grief is as nothing compared with a hissing, screaming, relentless fire crashing through the forest. But it is really funny how a warden will never forget cheese. He will buy American cheese, Swiss cheese, Limburger cheese, fancy breakfast cheese and then forget sugar.

On this morning I found potatoes, eggs and bacon but only two loaves of bread. I fried one twelve-inch pan of potatoes as full as it would hold, and two pans of bacon. After the bacon was taken

up I broke three dozen eggs—all that I had—into the two pans. You may ask how are you going to boil coffee, fry one pan of potatoes and two pans of eggs on a cool enough fire so that you can get near it without burning something crisp or covering something with ashes or tipping something over? Well, you've just got to, that's all.

When the meal was about half over the bread was gone, the bacon was gone and the egg and potato pans were not even greasy. I watched one big fellow when he started to eat. He took a thick slice of bread on which he placed two fried eggs side by side. He covered them completely with long strips of bacon, then clapped another well-buttered slice of bread on top. This went down so quickly he looked about thinking he had dropped part of it. He duplicated the order and sluiced it all down with three cups of coffee—



This is a type of country through which trails often must be made to reach fires—dense growths of underbrush that must be slashed away before the hoe-dads (broad grubhoes with no chopping bit) can be used. The men work under a tremendous strain, in smoke and heat, day and night.

lunch since the noon before. If you have ever cooked for seventeen hungry men over a campfire you will know just how the old saying "too many pots on the fire" got started.

When provisions are brought to a new fire they are dumped on the ground and it is up to the cook to unpack and get



When no water is to be found on the surface, the cook looks around for a skunk cabbage, for wherever it grows, water is usually but a few inches below the surface. A foot rule lies on one of the leaves of this plant.

coffee that would float a sledge hammer. My advance forces were terribly shattered but fortunately I had reserves. There was butter and syrup and a ten-pound sack of prepared hot-cake flour. Into each frying pan I poured a fire ladleful of batter. I fed those men hot cakes until they were too tired to eat more. I do not claim that I filled them or satisfied their appetites, but one at a time they crawled off into the brush and went to sleep.

The campfire is the big thing in camp cooking as one will find out when he gets down on his knees and keeps three pans of hot cakes going, without burning. As soon as one is done, it has to be taken up, the pan greased and refilled. Live coals are the best but if a pan is placed directly on the coals it soon smothers them and they become black and cold.

I have found but one good way to build a campfire where more than one pot or pan is to be used at a time. I dig a trench about three feet long, one foot wide, and four inches deep. It is a wise policy to have the trench running with the wind, but somehow the wind never blows one way long around a campfire. On each side of the trench I place a cut of green alder about five inches in diameter. The fire is built between them. Then I cut an armload of green sticks, preferably alder as they are usually full of sap, and place them four or five inches apart across the fire from one sapling to the other and place the pots and pans on them.

One may think that these sticks would soon burn but they usually last through the meal, and that is what counts. Getting through the meal is the big thing. And after a meal is over a cook has nothing to do except wash up the tins and pots and pans, chop wood and start the next meal.

It is surprising what an important place coffee has on the fire trail. Men who never drink it more than once a day, or not at all, will drink two or more cups four times a day in the open.

There is very little sickness. The men eat outrageously, become overheated, sleep cold, work long hours with little rest. Yet most of them leave the fire job in better condition than when they went on. It makes one think that maybe all this ailing race needs is good hard work and fresh air.

However, some men will eat more than is good for them. I recall one small, big eater who showed up on another fire job one morning after a semi-fast of several months' duration. He was built very much like a young crow—mostly mouth and gullet. He was straight of back and important of step. Perhaps at one time he had been a man of regular habits. He ate a big breakfast of beefsteak and eggs before he tackled the mammoth hot cakes. He ate his first cake in fair time—his appetite was satisfied. Yet he must eat against a day of need, so he jumped his second cake and subdued it.

Now I get pleasure out of cooking for hungry men but there is no fun in feeding a man when he is no longer hungry. I saw what was taking place and hoped to help

this fellow into the next world if that was where he was trying to get. I held the most perfect hot cake before him I have ever seen—brown, slightly crusted and steaming hot. "Here's your cake, Paddy," I said. He got up from the log he was sitting on, spraddled his legs in an effort to walk, but could not take a step. He shook his head and dropped back down on the log, his tin plate rattled to the ground. He was off feed for twenty-four hours and soon off the job. He simply could not stand prosperity. When men brag on camp cooking, and nine out of ten do, I know they are mis-

placing the compliment. It is their open-air appetites they should compliment. It is quite common for men to tell me on the fire trail that they never drank better coffee or ate better steaks or mulligan. But what they overlook is that they are sleeping in the open and working from twelve to twenty-four hours a day.

There is a long, gaunt, hungry type of men who cannot be filled up. They seem to eat as long as they have time and as often. I think they must be scattered over the globe by a definite law of distribution; like every community has its windy man, its scholar, and its Fourth of July speaker. So it is on the fire trail; each fire has its enormous eater. I need only mention one, whom I will call old Five Dollars because he was never more than five dollars ahead of the hounds in his life. And I found out why. His earning power never caught up with his eating capacity. He was always the first one up of a morning. Not that he was so full of energy that he wanted an early start on the fire trail. Far from it; it was hard to keep him on the trail. He got up early to eat. A few minutes start on the other men was a great advantage to him.

One morning I worked quietly—had breakfast pretty well cooked and the first hot cake almost ready to turn. But old Five Dollars must have winded it, for he came with bounds. He did not stop to wash,

but grabbed a tin plate and cut off a four-by-four of butter almost an inch thick and crouched by the fire with fork poised ready for the cake. I called breakfast; he would soon have competition. I tried to turn the cake, but it stuck slightly in one spot. Then I fumbled it, finally dashing it into the fire.

I shall never forget the look in old Five Dollars eyes. He yelled "Oh, oh, it's all right," and made a stab at it but missed. The cake was covered with smoke and ashes. He had lost. Other men were soon ready for breakfast. Jack got the first hot cake, Pete the second and so on. I am sure that poor old Five Dollars never thought as much of me after that.

On almost every fire someone is without blankets, and the nights even in July and August are anything but warm. Two husky boys came on the job one morning with no blankets, not even coats. They worked hard all day, their clothes were wet with sweat. After supper those boys flopped down by the campfire with a burlap sack for a pillow and slept like babes in a cradle until morning. Older men with



TO A COFFEE POT

Blackened Old Coffee Pot, here's to you,
 Pal of the miles we have wandered through,
 Out on the gypsy trail!
 Songs there may be that are sweeter than yours;
 Coffee, perchance, that the epicures
 Deem better than your best brew;
 But, pal, I'm at peace with the world while you sing
 Of the fragrance of pines where cool mosses cling
 To the rocks by the waterfalls;
 Of nights on the desert when coals burn low,
 And the sagebrush fires where the afterglow
 Stays through the starlit night.
 Blackened Old Coffee Pot, here's to you,
 Pal of the miles we have wandered through,
 Out on the gypsy trail.

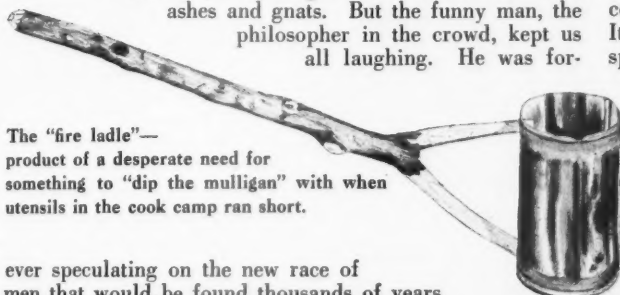
—Earl C. O'Roke

coats and blankets got up time after time that night and poked wood on the campfire. But the two young huskies never even groaned.

Some may think that the campfire would keep them warm, but there is no worse place to sleep than by a fire. They create a draft and if they are hot enough to do any good they will scorch one side of you while the other side freezes. Then if you turn over the scorched side will get cold much quicker than if it had not been heated. There is only about one man on each fire job that will take time to cut boughs, level off a place and actually make a comfortable bed. Consequently there is about as much misery found in the rest periods as on the fire trail.

But this fire-fighting business is not all misery by any means. There is almost always someone in each crew who can see the funny side of every situation and keep the men's spirits up even under the most trying conditions. I know that wardens often select such men solely for that purpose.

I recall one chap who saved our complete moral breakdown on more than one occasion. One day we were having it pretty tough, fire broke across the trail and swept through our camp. There were only a few men in camp at the time, the rest were out on the trail. Each man gathered up an armload of provisions and utensils and rushed across the fire line into burned-over ground. Here on the ashes, charcoal and wind-blown sand we camped. For three days I literally crawled on my hands and knees. Everything I touched was black, everything I cooked was full of smoke, ashes and gnats. But the funny man, the philosopher in the crowd, kept us all laughing. He was for-



The "fire ladle"—product of a desperate need for something to "dip the mulligan" with when utensils in the cook camp ran short.

ever speculating on the new race of men that would be found thousands of years hence, crawling on their hands and knees, with beards and skins the color of ashes.

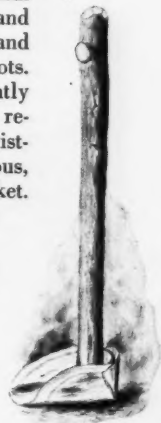
Occasionally camp can be pitched in a grove and near a lovely spring. But fires near such places seem never to last long enough. In such camps a cook sometimes has a few minutes of leisure, and it was in such a camp that the fire ladle was conceived. We were far from the beaten paths of men. I had made a mulligan. And shortly before meal-time I realized that there was nothing in camp to dip the mulligan with. The spoons were all small, the cups would all be in use, and there was three gallons of the stew—too much to pour well.

I racked my brain, trying to think. I was not used to it. Cooks are not hired for what they know. I tried to remember whether nature produced any ladles or not, whether there

was anything like a ladle growing in the Oregon forests. My eyes fell upon a forked limb, and on this limb I imagined an empty milk can.

I sprang to my feet. The world was mine at last. I cut and peeled the forked limb, took up an empty evaporated milk can and melted the rim from the cut end. A slot was cut in the can near the bottom and one directly in line with it near the top and the ends of the fork were inserted in the slots. The ends had to be pressed together slightly so they would hold the can firmly when released. Thus the fire ladle came into existence. It has not, however, become famous, for there are much better ones on the market. But markets have a way of keeping far from most forest fires.

When spoons are scarce men will not leave one in the sugar can, but dip their wet spoon into the sugar, making a mess of it. By taking a round tin, as a can top, and cutting two notches in it and folding up three sides a very good sugar shell can be made. In the middle of this shovel a round stick is placed upright and held in place by a nail taken from a milk box and driven through the tin into the end of the stick. One thing sure no man will try to stir coffee with it and it will shovel sugar. It has been named the "can and can't" spoon.



The "can and can't" spoon—invented to meet another emergency when spoons were scarce.

I will long remember my first night as cook on a fire job. Five of us started out in the morning with no camp kit—provisions and kit were to follow. We had a few dry sandwiches and a big load of fire-fighting tools to pack.

We reached the fire shortly before noon, ate the sandwiches and went to work. The fire had covered forty acres—whooping along at a good rate. We got in front of it and built trail until dark. By that time we were pretty well spent; our eyes and lungs burned from smoke. We were tired and hungry. We got out of range of the fire and selected a place to camp if ever provisions and kit came. A cold breeze sprang up that chilled us to the bone. Hours passed.

After we had each given our private opinions of fire wardens and settled down for a miserable night, in stumbled a warden with three fresh men. They brought, with other provisions, ten pounds of beefsteak. Here were ten mad, hungry men and it was up to me to feed them. There was no table, no stove, nothing but the ground to work on. I could not imagine getting a meal for ten men with almost nothing to do with in less than three hours; yet due to my own hunger, I think, we were all eating beefsteak, boiled potatoes and brown gravy in less than an hour. A great pot of coffee disappeared. Fire wardens were the best men on earth.

IN THE SEPTEMBER ISSUE

The lone figure of the forest fire lookout on the rugged mountains of the western National Forests has been the subject for song and story, but never before has such a dramatic phase of his life been pictured as in *Lightning on the Lookouts*, by H. T. Gisborne, which will appear in the September issue. It is a story of unparalleled adventure, of unsung heroism, of courageous service. With it in this issue will appear another chapter of the fire fighting organization of the government, *Radio and Forest Fires*, by Charles E. Randall.

And there will be many others of real interest, among them *Rainbow Rendezvous*, by R. C. Hogan, a fishing story with a lure; *A Forest Enigma*, by Paul M. Fink, revealing the origin of the "bald spots" of the southern Appalachians; and the *Meaning of the National Parks*, by Wallace W. Atwood. Too, Colonel W. B. Greeley will give his analysis of the present lumber situation in the Pacific Northwest. Watch for this issue!



The Smartest Thing My Dog Ever Did

By JAMES HAY, JR.

Whenever the owners of dogs foregather, the conversation inevitably comes to the point where somebody slides forward to the edge of his chair and enthusiastically begins with the ancient boast, "The smartest thing my dog ever did—"

Having heard these remarks countless times, Mr. Hay, a dog lover himself, set out several months ago to collect from well-known men and women stories of the smartest things their dogs had done. He wanted to find out just how clever dogs are—not "trick" dogs that had been expertly trained to do circus stunts, but the general run of dogs.

Beginning in this number, the stories related to him will be retold in *AMERICAN FORESTS*—a series of six astonishing articles which tend to show how even more marvellously than the human mind a dog's instinct, brain, or reason sometimes functions.—Editor.

IS A dog's instinct, in certain circumstances, far superior to a man's reasoning? Or is the dog endowed with a power of observation, by eye and nostril, so amazingly keen that its results merely look like reasoning?

Often have these questions been asked when astonishing accounts of "dog sense" have been related. And the questions must be answered by the listener, for the teller of the tale is apt to exclaim triumphantly: "You see, dogs can

reason!" The incident proves it. The men and women who told the stories which will appear in this series were modestly mute, however, when asked to explain how or why their heroes and heroines could achieve the performances credited to them. Their attitude, generally speaking, after concluding their narratives, was, with a mysterious smile: "You do the explaining," a challenge which is here and now passed on to the reader.



A flash back to the days when General "Billy" Mitchell took the long white trail in Alaska—starting out from Eagle City. Captain Burnell, of the Signal Corps, and Lieutenant Janda, of the Infantry, bidding him farewell. "Pointer" was the leader of his team.

General William Mitchell, the man who at St. Mihiel in the World War commanded the largest aero concentration in all history, has a number of pedigree dogs as well as thoroughbred horses on his country place at Middleburg, Virginia.

"The smartest dog I ever had," he said, "was old 'Pointer,' my lead dog when I drove a sled across the snows of Alaska twenty-eight years ago. Two other Army officers and myself, with a gang of men, were building telegraph lines up there for the Government.

"Pointer was not only clever, but a grand performer across country. With him as leader of my team, I once made a hundred and fifty miles over the snow in less than twenty-four hours.

"One day, with a fellow officer, we were making our way with a sled across the winter snow, following the bed of a stream. All of a sudden Pointer came to an abrupt halt, stopping the whole team. Some distance away, in a little draw ahead of us and to our right, was a hill dotted with scrubby pines. Pointer looked toward the hill and then, with an expression on his face that indicated the deepest concern, looked back at me.

"'Mush!' I called back to him. 'Mush!'

and cracked my whip. But for once he ignored the command to go. He looked first at the hill and then at me with that expression of worry.

"He continued to do so for several minutes, absolutely silent but impressively entreating. Around us was nothing but snowy waste. I knew there was not a human being within a hundred miles. Not a sound broke the stillness that lay thick as a blanket on the scene. But Pointer was smart, and Pointer was troubled.

"I'm going to unhitch him," I told my companions, "and see what's worrying him."

"Pointer, the moment he was unharnessed, made a bee line for the top of the hill, running as if for his life. Reaching the summit, he took one look down the other side, glanced back toward me and, lifting his muzzle to high heaven, emitted a long, blood-curdling howl. Those dogs, you know,

can't bark. They howl like wolves. When he howled the third time, still petitioning me from afar with his backward look, I put on my snowshoes and, asking my friend to do the same, set out for the top of the hill. Reaching it, I saw in the valley beyond, nearly a mile away, a lone prospector's cabin.

"In Alaska in those days the wintertime prospector would sink a shaft near his cabin, building a fire at the bottom so as to loosen up or thaw out the earth enough for digging still deeper. Then he climbed out and, by means of a rope on a windlass, drew up his big bucketful of earth. The earth thus accumulated would thaw out in the warm weather and he would go through it looking for gold.

"Nobody was to be seen near this cabin or the shaft. The only sign of human life or activity was a thin thread of smoke coming out of the shaft. As soon as I reached the hilltop Pointer went down the other side lickety-split. He didn't hesitate at the cabin, but, racing to the shaft, looked down into it.

"He howled again and looked back at me. I joined him and saw what appeared to be the lifeless form of a man lying across a smoldering fire at the bottom of the shaft. A few minutes later, and that fire would have

been flaming high. Thinking the miner might still be alive I went down the rope to investigate, and in a few minutes we had drawn him, still unconscious, up to the surface.

"The miner revived in a short while and told us his story. He had started his fire in the shaft and climbed up to use the windlass in taking out a bucketful of earth. He had fallen back into the hole, and there he lay, unconscious.

"Now," inquired General Mitchell thoughtfully, "how did old Pointer know of the miner's desperate plight? He couldn't see even so much as the cabin. Not a sound had reached our ears, and the smoke from the fire was invisible.

"I've thought about it many a time and I'm no nearer to a solution of the mystery than I was then.

"Incidentally," he added, "when good old Pointer died, with my own hands I raised a monument of stones over his grave. I loved old Pointer better than any dog I ever had."



In the old days, when Billy Mitchell and "Pointer" were pals. "The dog I loved best of all," says General Mitchell today.

Exploring the Streams of West Virginia

AND WHAT A SUMMER'S STUDY DISCLOSED

By JAMES G. NEEDHAM

THERE were thirty of us in the West Virginia Biological Expedition of 1930—out to learn what we could of the wild life of the state. For twelve weeks we climbed hills and waded streams. Mostly we waded streams, for the drought had burned the hills, and collecting was better in the water. The streams were low, their life concentrated in the runs and pools, and easier of access than in a normal season.

West Virginia is of extremely rough topography. "Curve" signs on the highways seem superfluous, since all are curved, differing only in degree of curvature. I had been motoring about the state for seven weeks before I came upon a stretch of highway that was straight for half a mile. They wind about the hills delightfully, and now and then turns in the road reveal scenes of surpassing beauty.

Once the entire state was wooded.

Once it held magnificent stands of the finest hardwood timber. Remnants of these stands remain in the most inaccessible places, but for the most part they have been reduced to stumpage and brush. Most of the state is woodland still—cutover forests with the trees trying to come back. A part, of course, is in farms. There are fine farms, smiling and prosperous, in the narrow valleys, and some on the scanty uplands; and there are lean and impoverished farms on the steep slopes of hills that should never have been cleared.

Our first camp was in Oglebay Park, at Wheeling—in the

rain—the only rain of the entire season which gave us an initiatory wetting as we waded up Polecat Run. Oglebay Park is a place of beautiful trees, thoroughly appreciated and carefully preserved; but beneath the forest cover there are too many "improvements" which are crowding out and destroying much that is of interest to the naturalist.

There wasn't much variety of life in Polecat Run. There

was still less in Wheeling Creek on account of pollution, but we found "good picking" in Buffalo Creek, near Bethany. This is a clean and beautiful stream, winding among wooded hills. Incidentally, we visited a small private preserve of magnificent virgin timber, adjacent to the campus of Bethany College. Across the valley from the campus we viewed a spot of unusual historic interest, a narrow bench of land that was once the camp site of the great



Out to get specimens and study wild life, particularly water forms, thirty members of the West Virginia Biological Expedition went out from the University, climbing the hills and wading the streams, last summer. This map shows the twelve camps they made, and also some of the best collecting grounds near them.

Logan, the Mingo Indian chief. Our second camp was below Sistersville, on the Ohio River. That once fertile stream that so charmed the early explorers with its beauty and nourished them with its products, we found to be, from the naturalist's point of view, now an aquatic desert, ruined by pollution. Only a few of the hardiest fishes and other aquatic animals are to be found in it.

The need of selecting our streams for collecting, already learned at our first camp, was abundantly reinforced at the second. This was in a region fairly besprinkled with oil

wells which pump salt water into the streams. The stream nearest our camp, Anshutz Run, ran seven per cent salt according to analysis. Needless to say, there was no fresh-water life left in it; but instead its pools were teeming with salt flies, *Ephydra*, and salt wort, *Salsola*, was growing along the banks.

We found a clean and productive stream some miles away. It was Middle Island Creek, and the place in it that we visited, locally known as "The Jug," is of unique interest. Here the stream, encountering a barrier ridge of rock, makes a loop several miles long and comes back on the lower side of the ridge fifty feet away. This is the neck of the jug. Through this barrier a channel has been cut to supply power for a mill now abandoned. Thus an ox-bow lake has been artificially created. The flood waters in part still course the ancient, sluggish channel. Aquatic life was abundant here. Indeed, the bottom of the cut through the rock barrier was fairly paved with large fresh-water mussels in considerable variety.

We passed on down the river and inland to succeeding camps at Ripley, Hamlin and Williamson. Then we were among the coal mines, where stream contamination was from mine water containing not salt, but sulphur. In hunting for clean streams in this land of ruthless exploitation I soon learned to study carefully a good map of the state that showed the location of oil wells, gas wells, coal mines and railroads. If I could

find a place with a permanent stream in it lacking all of these, there I could be sure of good collecting.

The upper Guyandotte River, above Justice, was such a place. Its pools were full of fish; its riffles were teeming with



Members of the party busily collecting fresh-water sponges from among the sandstone boulders in the bed of the Guyandotte River.

A bit of Cranberry Glades, where a "hanging" sphagnum bog overspread a shoulder of the mountain at an elevation of 3,600 feet. The dominant tree in the vicinity is black spruce.



Photographs on this page by Miss Caroline Swanson.



Members of the party on the Guyandotte River below Hamlin, West Virginia. Second-growth forest on the hills in the background and hard-packed gravel at the streamside with beds of water willow (*Dianthera*).

(Below) Where some interesting aquatic animals were collected in Buffalo Creek.



aquatic insects. Burrowing in its sandy bed were countless dragonfly and mayfly larvae. Among the sandstone boulders in its deeper rapids there was a fine growth of freshwater sponges.

Our remaining camps were all in the Allegheny Mountains on the eastern side of the state. Leaving a region of sand and soft water, we ascended to one of lime-

(Continuing on page 511)

EROSION DARES THE WEST

By W. R. CHAPLINE

WHEN the white man came to the West he found a country far different from that which we now know. The Indians had made but little use of the agricultural possibilities, the forests were virgin, abundant herbaceous and shrubby vegetation was available for the wild life which abounded everywhere. Mountain streams ran cool and clear and were filled with trout. Even the desert supported perennial grasses sufficient for freighters into early southwestern mining camps to hobble their sixteen-horse teams for night grazing where they stopped along the road. In his conquest, the white man has harnessed the streams for irrigation and power, the desert has been brought under cultivation through irrigation, mines have given up their minerals, the forest has yielded its timber and other wood products, and the ranges support an extensive livestock industry.

Thus a new civilization has been built up within the space of fifty to seventy years. Prosperous farm homes have been established, schools, churches and villages dot the irrigated valleys, and large urban centers have gained added impetus in their growth, if not their main development, from dependent irrigated farming lands. One-fifth of the population of Arizona, for example, is located in the irrigated portion of the Salt River Valley. Idaho has a heavy concentration of its population in the irrigated Snake River Valley and its tributaries. The rapid development of southern California would not have been possible without water, and its future development depends in large measure on the successful and adequate development of the Colorado River, of which the Hoover Dam is the first outstanding construction. This stupendous project with its 700-foot dam will impound 30,500,000 acre-feet of water, irrigate over 2,000,000 acres, develop over six and one-half

million dollars annually in power and furnish the needed domestic water supply for Los Angeles, San Diego and other Southern California cities.

Into this new western civilization, taking shape on such a grand scale, the menace of soil erosion has flung its dare, with a gigantic grimace. Erosion depletes the soil by removal

of the productive top layer. It increases the destructiveness of floods and through the deposition of silt and other erosion debris destroys valuable properties. The silting of reservoirs and other irrigation works in the west is already seriously endangering established projects and at the rate erosion is increasing, it is making prospective ones uncertain.

The Zuni Reservoir in New Mexico, for example, has in twenty-two years filled with erosion debris to over seventy per cent of its capacity, practically destroying its usefulness. By 1925, but nine years after the completion of the Elephant Butte Dam in New Mexico, almost nine per cent of the reservoir capacity had been taken by erosion debris. Indications are that erosion is increasing on crucial parts of the watershed.

A survey of a portion of the Boise River watershed in Idaho disclosed that only twenty-seven per cent of the area had escaped erosion. Much

of the upper soil layer on fifty-six per cent of the area had been lost by widespread sheet and light gully erosion. Serious gully erosion is occurring on the remaining seventeen per cent. The reservoir and other irrigation works are being severely silted, despite costly efforts to keep down these accumulations.

Silt presents the most serious problem of the lower Colorado River. Silt formed the Imperial Valley by damming it off from the Gulf of California and thus created much of the agricultural wealth of the valley, yet it threatens to



The depletion of all vegetation on steep slopes resulted in this arroyo in central Utah, gouged out by flood waters following torrential rains.

destroy this wealth. The floods of the Colorado River become especially serious and costly because of the vast amount of silt which the water carries and deposits in the river bed and on flooded land, necessitating higher and higher levees, clogging the irrigation canals, and sealing up the soil with fine suspended particles. Fortier and Blaney have estimated that silt requires from the farmers of the Imperial Valley an average annual expense of \$2 an acre. These investigators also estimate that an average of 253,628,000 tons or 137,000 acre-feet of silt are carried past the site of the Hoover Dam annually. At this rate the reservoir would be filled with erosion debris in about 220 years, but its effective usefulness as a flood control and irrigation water reservoir will be materially reduced if not destroyed long before that.

The water flow of the Colorado River varies greatly during the year. A great flood occurs usually in the spring following the melting of snows on the watershed; at other times the flow may become very low. Furthermore the amount of water varies greatly from year to year and may for several years at a time be inadequate for the proposed development in the lower basin, especially when large additional areas are brought under irrigation in the upper basin and the necessary reservoirs become shallow through silt accumulations, thus increasing the proportion of water evaporation from them.

Irrigation developments, even though they may pay for their original cost before the reservoirs are destroyed by silting, become useless in fifty or one hundred years or more.

In places this period may be extended by rebuilding the dams and increasing their height. But, with evaporation averaging eight feet or more a year, as it does at the Elephant Butte Reservoir, and with each increase in dam height exposing a greater expanse of water to evaporation, there is a practical limit to this expedient. Dredging has been suggested as a silt-removal measure but costs so far have proved exorbitant. Even if the effective life of a reservoir can be doubled, through such expedients, what is to become of the civilization which it was instrumental in creating when the usefulness of the reservoirs is destroyed by silting? Engineering works may be written off the books but human life and community development cannot be so treated. We must look forward 200 to 500 years or even more for permanency of such social developments and determine erosion-control measures that will make this possible.

Numerous factors, of which climate, soil, topography and geologic formation are doubtless the most important, influence erosion, but the vegetative cover is the main single controllable factor. The natural balance on the western arid and semiarid lands, between the forces that tear down

and those that build up the soil, is a delicate one, but if the vegetative cover is not disturbed erosion is usually slight. Drought, cloudbursts, snowslides and other natural phenomena may unbalance the delicate equilibrium which nature has so carefully developed and may lead to excessive erosion. But nature, if unimpeded by man, quickly sets to work to reestablish the balance; the vegetation gradually spreads over the scars, the slopes assume an angle of repose, and eventually the normal conditions return.

Man's activities, however, by reducing the vegetative cover or altering the topography or soil, can and do upset the balance completely. Where this occurs these activities are seldom abated and severe erosion follows. Once started, this may develop to disastrous proportions.

There is ample evidence that erosion has become much more widespread and more serious since the white man's occupancy of the West. Numerous small valleys which in pioneer days were covered with grasses and trees and through which small streams meandered, have been destroyed by wide, deep arroyos, following destruction of the protective cover on the watersheds, attempts at hillside cultivation, the clearing of timber and brush along stream courses, the construction of roads and trails without proper drainage and other unwise developments. Forest and brush fires devastated vast areas in the early days of settlement and even now, with great effort being made to control them, fires destroy the vegetation on hundreds of thousands of acres in the West every year. Lumbering is

thinning the timber stand, hydraulic mining has cut out the sides of gulches and rich valleys, and smelters have seriously depleted several hundred thousand acres.

Overgrazing has doubtless been the most important factor in the reduction of the protective cover on watersheds. Before 1890 more livestock were on the ranges than they could support and this condition prevailed on practically all ranges for twenty years or more. The most palatable forage plants were killed, leaving only a scant stand of low-value vegetation. Excessive trampling destroyed plant roots and packed the soil. Under such conditions there was little to check the rain as it fell; the more compact soil could not absorb the water which ran off and was quickly converted to a slimy mass of flowing mud. Shoestring gulleys started and speedily gained depth, further accelerating the run-off, while the main drainage channels became raging torrents.

Although the regulation of grazing within the National Forests and a better appreciation on the part of the stockmen of the value of abundant feed has aided in checking the erosion, at least locally, several hundred million acres are still overgrazed and erosion on these areas is becoming



The silting of reservoirs seriously endangers the efficacy of great irrigation projects in the West, as clearly indicated by this photograph taken in the basin of the Roosevelt Reservoir at low stage. The silt caught and held by this old stump is startling proof of the amount that is carried in precipitation into the waters of such reservoirs.

more severe yearly. This condition prevails particularly on the greater part of the 196,000,000 acres of Public Domain and the vast area of state and private lands intermingled with this Public Domain on which at present grazing cannot be controlled legally.

Probably the greatest loss from this range deterioration and soil depletion through erosion has been the reduced productivity of the range lands for livestock grazing. In their original condition the slopes and valleys, except in those arid parts where rainfall was very light, were well carpeted with valuable grasses and a small percentage of other herbaceous and shrubby plants. The decaying vegetable matter had built up the surface soil into a friable condition and added to it a large quantity of rich organic matter. The mulch of decaying vegetable matter acted as a

drainage into flood crests present a watershed problem that may assume disastrous proportions. During the summer of 1930, Utah, for example, suffered from very severe floods. Whole slopes were excessively eroded. Great gullies were cut in the hillsides. Soil, rocks, and other forms of erosion debris from slopes and canyons were carried out into the valley to cover with a layer one to several feet deep orchard lands valued at \$600 to \$800 an acre. Homes were swept away or filled with earth and rocks. It cost \$100,000 to open and repair the highways alone. There is little question but that the depletion of the vegetation was one of the main factors in the severity of these floods. The report of the Governor's Special Flood Commission concludes that "there is ample evidence on the watersheds of Davis County to show that had the plant cover been approximately equal to its original natural condition, the flooding in that section



A dramatic close-up of the waters at work. It is the Salt River, in slight flood stage, cutting out the extensive silt deposit in the upper part of the Roosevelt Reservoir basin and carrying the mud down nearer the dam.

sponge, and the friable humic character of the soil allowed a maximum moisture penetration. The result was that the more succulent forage plants made the most of the rainfall and the fertile soil and produced abundantly.

When erosion removes six inches or more of the fertile topsoil, as it has done on large areas of such important watersheds as the foothills of the upper San Joaquin Valley, the mountains of central Utah, and the Boise River watershed of Idaho, the sterile subsoil remaining is incapable of producing the forage the land once supported. Years of careful management will be required to restore the soil and vegetation, yet this must be done if the abnormal erosion which is occurring is to be controlled. The importance of restoring a satisfactory cover may be appreciated when it is realized that for every acre of the 1,700,000-acre Boise River watershed there is a dependent value of farmland alone in the irrigated valley of this project amounting to \$32.

Not only is there reduced productivity of range lands and excessive silting of reservoirs, but the more rapid run-off from the depleted slopes, the greater quantities of silt carried, and the quicker concentration of high water from small

from the rains of 1930 would have been far less serious, if not prevented."

The report brings out further that a study of the deposits at the mouths of canyons show that "floods like those of 1923 and of 1930 have not been normal occurrences . . . in the past. . . . Their occurrence in recent years is to be looked for in changes from some previous condition. These changes are found in the plant cover of the watersheds."

Engineering works have been suggested for erosion control. These are important and will aid materially, especially large dams and channel control works in rivers, and small dams, settling basins, and other works in the tributaries. These works, however, will prove ineffective and of but temporary value unless the erosion and rapid run-off can be controlled by vegetation at its source on the watersheds.

Plants not only lessen the force of rainfall but intercept part of it. Vegetation improves soil structure, allowing greater moisture penetration; it increases the water-holding capacity of the soil by increasing organic matter; it breaks the effect of wind; it binds the soil and lessens sheet erosion; it obstructs run-off and reduces the velocity of flow and thus the carrying power of the water; and by catching soil par-

ticles it tends to form miniature terraces on slopes and dams and fills in small gullies. The more complete the plant cover, the more adequate is the protection against erosion.

Erosion-streamflow experiments on forest and range lands have indicated the value of this vegetation in controlling erosion. The results of some of these may be of interest.

In the Wagon Wheel Gap experiment in the mountains of Colorado, Bates and Henry report that the rapid clothing of the watershed, from which the aspen and other timber had been cut, with a dense stand of aspen sprouts and other shrubby and herbaceous vegetation, prevented any material erosion.

Studies by the Southwestern Forest and Range Experiment Station on the semidesert watershed of the Salt River Valley project in Arizona show that the grasses and other herbs

which normally grow between the shrubs are the controlling factor in protecting the soil surface against erosion. Under heavy grazing a rapid decline in grass density follows each year or cycle of below-average rainfall. In the absence of grass the surface soil that was built up by the supported grass washes away readily. Run-off, accelerated by lack of herbaceous cover, is deflected between the shrubs, rapidly

cutting gullies which may in a few years become from two to five feet in depth within one hundred feet of their sources.

Studies by the Intermountain Forest and Range Experiment Station show that the serious erosion on the Boise River Watershed in Idaho has been caused by depletion of the natural plant cover by overgrazing and drought, trampling by livestock, rodents and fire. Ungrazed, well-vegetated areas even on slopes



Overgrazing has doubtless been the most important factor in the reduction of protective vegetative cover on watersheds says the author. This is an example of improper grazing in the West resulting in destructive gullying and serious sheet erosion.



And this shows the other side of the picture—land brought back into use. This gully had, prior to 1900, cut through and drained an alpine meadow on the Manti National Forest in Utah. Under regulated grazing, it has since been completely reclothed with vegetation, and erosion is now controlled.

with a gradient as high as ninety per cent almost uniformly have a smooth, undisturbed, uneroded surface. Only four per cent of the area densely covered with vegetation is eroding badly even when grazed. Most of the area scantily covered with vegetation shows severe sheet erosion and twenty per cent is badly gullied.

On an experimental watershed on the Wasatch plateau in Utah where past overgrazing had depleted the vegetative cover until it occupied only about sixteen per cent of the surface an average of eight to nine tons of soil were eroded annually from each acre between 1915 and 1920. Starting with the latter date effort was made to increase the plant cover as rapidly as possible by artificial and natural reseeding and since 1923 the watershed has supported an average cover of forty per cent. By comparing results with a check watershed, it was found that the increase in vegetation from a sixteen per cent cover to one of forty per cent brought about a sixty-four per cent reduction in surface run-off from summer rains and a fifty-four per cent reduction in sediment removed by these rain storms.

The forty per cent plant cover had no material influence on surface run-off from melted snow in the spring as compared to a sixteen per cent cover. On the average fifty-six per cent of the available snow water supply ran off of the watershed in the years 1916, 1918 and 1919, and sixty per

cent of the snow water supply in the four years, 1926 to 1929, inclusive. The greater cover prevailing in the period since 1926, however, reduced sediment per acre washed off the watershed by sixty-seven per cent.

These Utah studies by the Intermountain Station show further that under extreme depletion of soil and plant cover it requires many years of careful management to restore the watershed values. They show that total exclusion of livestock from ranges is not necessary except where the plant cover has been almost eliminated and the fertile part of the soil carried away. They emphasize the essential need of effective regulation of grazing.

The erosion-streamflow problem is so important and yet so complicated throughout the West—and the entire country—that intensive studies of the problem in all its aspects should be undertaken on every major watershed. In view of the important part that vegetation plays in controlling erosion of our soils it is essential that research determine the best type of plant growth for the widely varying soil types and climatic conditions of the West, the influence of this vegetation on water supply, and how it may be restored and maintained most effectively. It is equally important to know more concretely the extent to which timber cutting and grazing can be allowed under each of the main timber, range and watershed conditions in keeping with maximum protection to the soil.



Arthur M. Hyde.

A Message from Secretary Hyde

Unable to leave Washington to attend the sessions of the Annual Meeting of the Association, recently held at Asheville, the Hon. Arthur M. Hyde, Secretary of Agriculture, sent the following inspiring message, which was read to the members on the evening of the banquet.

"To the officers and members of The American Forestry Association in annual meeting at Asheville, North Carolina:

"The urgent requirements of public duties here have compelled me to decline your invitation to Asheville. I wish that I might more directly participate in your proceedings and offer in person my felicitations.

"The first meeting of The American Forestry Association was in 1876; the same year in which Congress made its initial provision for our Department of Agriculture work in forestry. The American Forestry Association, however, was, if I am rightly informed, reborn in 1882.

"Our own work for forestry in the Department of Agriculture owes much to The American Forestry Association. In season and out of season, you have proposed and championed sound governmental policies looking to the perpetuation and wise use of one of our greatest natural resources. In season and out of season, you have served as a lighthouse to public opinion. Now, looking backward to measure the notable and inspiring progress made in the fifty-five years, your Association may, with well-founded pride in past achievement and fresh confidence in its power to serve, eagerly press forward to larger endeavor in the general welfare.

"Your meeting this year gains special significance not only from its time but also from its place. At Asheville the practice of forestry, under the direction of men schooled in its science and art, was first cradled in the United States. The child has waxed mightily since the first cuttings and plantings on the Biltmore estate began. They marked the beginning of American silviculture.

"We have made enormous gains since forest management began at Asheville. The Appalachian Forest Experiment Station, with its headquarters at Asheville, is merely one of a chain of regional forest experiment stations maintained by the Department of Agriculture to obtain the basic knowledge necessary for successful forest management throughout the length and breadth of the United States. Broader research, both pure and applied, is essential to realizable progress in solving the conservation and use problems of American forestry.

"Most of the forestry property on which the application of forestry was begun in the vicinity of Asheville is now included in the Pisgah National Forest. The Weeks Law of 1911 inaugurated the acquisition policy which has made possible our system of eastern National Forests. It is interesting to recall that the movement for it began in North Carolina, also that your Association was one of its earliest and most effective supporters. Since the Weeks Law was passed the acquisition policy has been materially broadened. Possibly a still broader policy of public acquisition, Federal, State, or Federal and State combined, may eventually be found necessary to give employment to lands submarginal for agriculture and to lessen the pressure of agricultural overproduction.

"Many problems, however, must wait upon finance. When our financial skies have cleared so that ways and means for further advancement are assured, the Department of Agriculture will be prepared to keep step with the needs of the times. We shall hope for the support of your Association for the future as in the past."

"STOP" LIGHTS FOR FISH

By ANTHONY WAYNE

ELECTRICAL traffic devices for fish! The finny clan may be guided electrically along river and stream highways from the mountains to the oceans much the same as

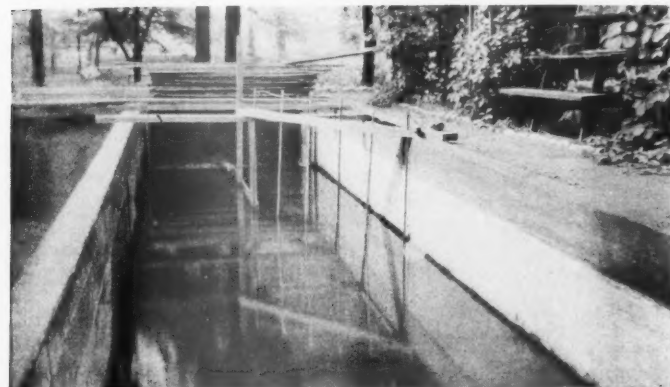
from detouring into irrigation ditches, but the trouble is that these wire barriers must be so small, at least a quarter of an inch in mesh, that they become immediately filled with leaves and water debris and clog up and stop the flow of water.

Mr. McMillan became interested in applying electricity to the water in a way that would gently shock the salmon and trout into keeping in the main streams.

He built an aquarium with glass sides, and wooden bottom and ends. This he fitted with two parallel metal plates having as near as possible the same cross-section area as the aquarium. These plates were connected with the power lines. With such an apparatus he discovered many interesting effects. He found, for one thing, that it didn't take very much electricity to paralyze a fish. He found that long fish required less electricity to stop them than the short ones, which is exactly opposite to what might be supposed.

He discovered, too, that electricity in the water affects fish according to their vitality and accord-

ing to the direction in which they are swimming. He noticed that sometimes the fish would be stunned but that upon reaching a pocket of water where the electricity diminished they would regain normal habits and ways of swimming. Another odd effect was that when a group of fish were stunned by too much electricity in the water they would recover in the inverse ratio or order—that is, those paralyzed (*Continuing on page 510*)



The electric screen in place in the concrete pool at Bonneville, Oregon, where the reactions of the fish to the electrified water were closely observed.

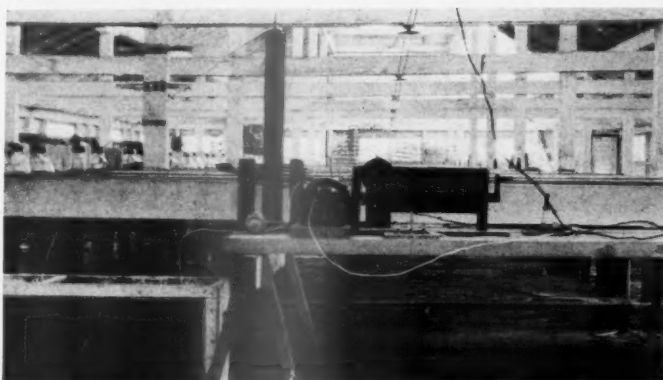
motorists are protected along arterial streets. F. O. McMillan, electrical engineer of the Oregon State College, in cooperation with light and power companies, the United States Bureau of Fisheries and other interested agencies, has perfected a number of ingenious devices that will guide salmon, trout and other finny friends along their watery courses away from side traffic danger.

To electrically control fish traffic may seem like wasted effort and misapplied energy, but in our present crowded civilization, conservation and use of natural watercourses, coupled with our need of fish for canneries and food supplies, the problem of how to save the reckless fish that wander off the main highways is a real one. Every year millions of game fish are carried out on the fields and left to die because they have followed some irrigation canal instead of the main stream channel. Many others are killed by mechanical devices that exert sudden pressures, such as hydraulic turbines. The problem of protecting fish from these dangers is as old as the knowledge of irrigation. Numerous laws have been passed, but like traffic rules it is easier to legislate than it is to enforce, whether the subjects be the poor fish or human beings.

There are numerous barriers along the Pacific Coast streams to keep the young fingerling salmon



Then the screen was placed in an open pond and it worked just as well in controlling the fish traffic. They quickly turned, as if acting on a signal light! The weather apparently made no difference.



The use of this high-frequency apparatus disclosed the fact that the voltage traveled on the surface of the water and did not affect the fish within the waters at all.



Strikingly characteristic are the fruit and beautiful fan-shaped leaves of the ginkgo.

A Living Fossil— The Maidenhair Tree

By H. J. LUTZ

THE maidenhair tree, or *Ginkgo biloba* as scientists call it, is fairly well known. Doubtless every person familiar with it has been impressed with the peculiar beauty of its fan-shaped leaves and its conical or pyramidal crown. Yet probably few fully appreciate the unique position which this remarkable tree holds. How many people, as they sit in the friendly shade of the ginkgo on a lawn or in a city park realize that they are being sheltered by what is, geologically speaking, the world's oldest tree? How many know that the ginkgo is the sole survivor of a large family of plants which ages ago flourished in all parts of the world? Here is a tree which can easily trace its ancestry back to one of the "first families."

The peculiar leaves of the ginkgo are so characteristic that their fossil occurrence serves as trustworthy evidence of the tree's existence during remote geological periods. It seems entirely probable that representatives of the ginkgo family existed near the close of the Paleozoic time, over 200,000,000 years ago. It is certain that the ginkgo has come down to us through at least 10,000,000 years so little changed that it is difficult or impossible to find essential differences between the leaves of the fossil and the modern forms. It appears that the ginkgo has long overstayed its time on the great stage of life; yet it still remains with us, a reminder of the dim past—a living fossil.

The fossil evidence which is piling up indicates that during the Jurassic period, 150,000,000 years ago, the ginkgo reached its greatest geographical distribution. During that period it flourished in every country of the world, from the Arctic re-

gions to the south temperate regions. Fossil remains from Oregon, Alaska, Canada, Greenland, Siberia, England, Europe, China, Japan, and Australia testify to the past glories of this interesting tree. During millions of years of geological time the sun never set on the ginkgo.

Long ages before man is known to have existed on the earth the greater part of Europe, much of Asia and North America and even part of Greenland were clothed with luxuriant forests. These forests were largely evergreen and were made up of a mixture of species in which ginkgo was especially prominent. Then came the ice age and as the great glaciers advanced out of the North they destroyed the maidenhair trees and other vegetation over tremendous areas. Fortunately the ice sheet did not reach China, Korea, or Japan and there the ginkgo was able to survive. Although this catastrophe did not completely wipe out the tree it did effectually eliminate it from the vast areas where formerly it held a position of first importance.

The earliest known mention of the ginkgo is found in a Chinese book on agriculture which dates from the eighth century A. D. Although this is the first recorded mention of the tree it seems certain that it was known to the Chinese at a much earlier date. On the other hand, it seems probable that the ginkgo did not reach Japan until about the middle of the sixth century of the Christian Era when it was introduced along with Buddhism. So far as we of the West are concerned the ginkgo was first discovered in the early part of the eighteenth century by Engelbert Kaempfer, a surgeon employed by the old Dutch East India Company.



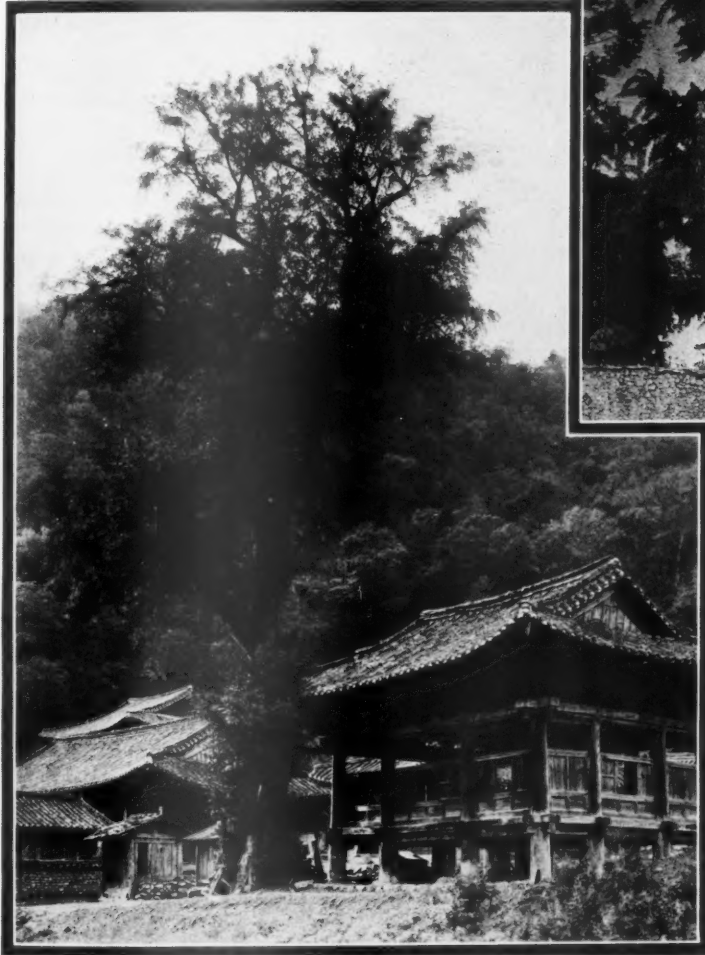
E. L. Crandall

The maidenhair tree is well adapted to street planting, as it is beautiful in form and immune from insect attack.

The ginkgo has been cultivated for centuries in China and Japan where the people consider it a sacred tree and grow it in connection with their temple groves. There is little doubt that the protection and cultivation given this tree by the Buddhists largely account for its preservation from extinction. After the glacial age the ginkgo seems to have lost its aggressiveness and was unable to extend its range following the retreat of the ice. Probably it does not grow wild today but it is believed that formerly it grew spontaneously in western and southwestern China. Many explorers have sought to find the tree in a wild state but so far none have been successful.

The common name given the ginkgo—the maidenhair tree—refers to the remarkable resemblance of its leaves to the leaves of the maidenhair fern. The scientific name, *Ginkgo biloba*, was first applied in 1712 and alludes to its deciduous habit and the usually two-lobed character of the leaves. As early as 1578 a Chinese author referred to it as *Ya-chio-tzu*, which means “the tree with leaves like a duck’s foot.” In China at the present time it is called *Yin-kuo-tzu*

or “the silver-nut tree.” In general the ginkgo has the features of a modern coniferous tree with its pyramidal or conical crown. Some of the trees attain impressive size. Heights of 125 feet are



Photographs by courtesy of the Arnold Arboretum

The maidenhair tree has been justly called a unique relic of bygone days, which was undoubtedly saved to modern times because of the loving care bestowed upon it by the priests about the temples of China and Japan. This fine old tree stands at Kongo-san, Korea, in the grounds of the Chonji Monastery.



The glamour of the ages falls about the ginkgo, for these trees antedate the existence of man on the earth. Fossil evidence proves them to have existed in every country of the world and for millions of years of geological time the sun never set on the ginkgo. This is an ancient specimen growing in western Szechuan, China.

sometimes reached and diameters of nearly ten feet have been recorded. The ages reached are also noteworthy. In Japan it is claimed that the largest trees are over 1,000 years old.

Its leaves have a characteristic fan-shaped appearance and look very much like the magnified leaves of the maidenhair fern. The mature leaves have a rather leathery texture and in this respect are in decided contrast to the thin, delicate leaves of the fern. The leaves are deciduous; that is, they are shed each fall. In this respect the leaves of the ginkgo resemble those of such conifers as the bald cypress and the larch.

The globular fruit is yellowish in color and

consists of a hard-shelled nut surrounded by a thin outer flesh. The flesh has an exceedingly disagreeable odor. It is unfortunate that the outer flesh is so evil smelling for otherwise the fruit would be attractive. The nut itself contains a starchy kernel which has an almondlike flavor. After slight roasting this kernel is eaten with great relish by the Chinese and Japanese. Nuts from the ginkgo have been used in the Orient for centuries and it seems entirely probable that this is the oldest cultivated nut tree in existence.

In most modern trees of the temperate zone the wood is differentiated into an outer sapwood and an inner heartwood. In the ginkgo this differentiation is lacking. The wood is white in color, fine-grained, easily worked and is extensively used by the Japanese for making chess boards and chessmen as well as for small carved articles. It grows under a variety of soil and climatic conditions and is especially desirable for planting as a street tree in cities, where only the trees not bearing fruit should be used



J. Horace McFarland

Literally a lineal descendant of one of the "first families" of the plant world, tracing an ancient ancestry, the ginkgo fits perfectly today into modern park and landscape use.

to avoid the unpleasant odor. Not only is it resistant to smoke but it also appears to be unusually hardy and well able to withstand drought and heat. The tree is not known to be attacked by insects and fungus diseases; its astounding vitality is an outstanding characteristic. The pyramidal or conical crown makes the tree well suited for planting in narrow city streets where there is but little room for crown development.

Probably the finest specimens of the maidenhair tree are found growing in Tokyo, in Japan. The old trees in that city are objects of rare beauty. Excellent results in planting have also been attained in many American and European cities. As this unique tree which links the present with the past becomes better known in America its cultivation will doubtless become even more widespread. The eternal ginkgo is probably now being planted in some of the very places from which it was banished when the great ice flood moved slowly down from the North, millions of years ago.

SAVE THE TRUMPETER SWAN

(Continued from page 454)

and came sliding into the water, a downy white cascade of fluffy forms. Two minutes later all were floating about like downy white powder puffs. They flitted and paddled about, seemingly at home. After a moment they dipped their tiny bills under the surface, raising their heads, and slowly drank the water. Then they fluffed out their downy wings and shook their little tails exactly as their mother had done.

While the cygnets were thus playing, their mother arose and climbed back upon the nest where she flapped her wings and shook her feathers thoroughly. The youngsters followed this lead and clambered slowly back up the tules until they reached the top of the nest. For the first time I obtained a satisfactory count. There were six of them. Later investigation of the nest showed that all of the eggs had hatched. As soon as the mother swan began to brood the young again, she reached over and, with her long neck extended, picked up pieces of decayed tules and began to build up the rim of the nest which had been partly destroyed. This is the first time in many years of experience that I have ever seen a family of wild game birds of any species return to the nest after they had once left it. The swan family remained on the nest for the rest of the day.

I was up at daylight the following morning and found the mother swan still on the nest brooding her downy young. The male swan was standing guard at his usual place on the islet nearby. At 7:40 o'clock, when approximately twenty-four hours old, the six downy cygnets left the nest, led by

their mother and protected by their father. The whole family swam away to feed in the shallow water. At this juncture I launched a portable rubber boat and the male began to trumpet, uttering a single loud, resonant, warning note, "konk!—konk!—konk!", repeated at intervals of about three seconds. He came boldly out to meet me and made a valiant attempt to deflect my attention from the mother and the downy young, which swam hastily to the shelter of the tules. Instead of the young following the mother's lead to a distant portion of the lake, even at this early stage, they immediately sought to escape by going their own way.

Mr. Bent, in his monograph of North American waterfowl, states that he had been unable to find any published description of the young trumpeter swan. I was therefore anxious to observe one at arm's length. The first cygnet that I pursued made his escape in the denser portion of the tules where I could not locate him, although I could distinctly hear his low call note, "screep, screep, screep," uttered at intervals of about three seconds. Even the voice of the day-old trumpeter swan, which could be heard at a distance of 100 yards, is characteristic, being low-pitched and more resonant than that of any other bird of its kind I have encountered. Two of the cygnets attempted to escape my notice by remaining quiet in one of the darker pockets amid the tules. I followed another that attempted to hide in the open. The young swans, it appeared, were not only able to swim well but were able to clamber over floating masses (Continuing on page 492)

The Three Million

LEAVING AN ARMY OF YOUTHFUL CRUSADERS WHO WILL CARRY ON, THE ASSOCIATION COMPLETES ITS EDUCATIONAL PROJECT IN THE SOUTH—ITS SLOGAN "GROWING CHILDREN NEED GROWING TREES" STILL RINGING THROUGH THE PINEY WOODS

By

W. C. McCORMICK

THREE years—three million people. Thus could be told in terse words the story of the Southern Forestry Educational Project of The American Forestry Association and the states of Florida, Georgia, Mississippi and South Carolina which was completed June 30. With more latitude it could be told that three million men, women and children in the rural and backwoods regions of the four states have been awakened to the manifold benefits of green trees and inspired with a zeal to protect their forest resources from fire. Through the medium of motion pictures, lectures, exhibits and actual demonstrations they have been shown that the deeply ingrained custom passed down from father to son that indiscriminate and wholesale burning of the woods is destroying the productivity of the land in which they live and opportunities for them to better their social and economic life.

Inaugurated in 1928 to change the public attitude or state of mind of the local people in respect to their natural resources by implanting in the minds of both children and adults a clear understanding of the destructive effects of woods burning, the educational project has carried forestry in motion pictures and lectures into 6,000 rural schoolhouses, while more than 2,000 programs have been given in churches, civic auditoriums, or at cross-road stores and

community centers. Every rural school, for both the white children and negroes, was visited in Florida and Mississippi one or more times. Nearly eighty per cent of the rural schools in Georgia were visited, while the percentage in South Carolina is a little lower. Millions of pieces of literature, rulers, posters and other printed matter have been distributed. Seven motion pictures, totaling thirteen reels, were produced for the work by the project.

Pioneer in character, the initial three-year effort with respect to its influence on the rural life and forest futures of the South, can be measured only as a book can be measured by its first chapter. The evidence is clear in word and action, however, that the woods-burning habit inherent with the Southern ruralists has been staggered by the assault of the Dixie Crusaders, as the lecturers and motion picture operators have come to be known, and that a marked change in forest thought and attitude has been brought about. The bitter pill of ignorance has given way to the tonic of knowledge.

First, a new sentiment, or rather a sense of forest appreciation, has made remarkable advances in many regions. Throughout the four states a very apparent consciousness of the evils of woods burning is general in the rural districts. Second, there has been active organization for the preven-



Five of the eight trucks which traveled 284,000 miles through the backwoods and rural districts, carrying to the men, women and children of four Southern States the message "Stop Woods Fires."

tion and suppression of fires, having its origin wholly in the facts presented by the workers of the project. As a result the public mind has expressed greater confidence in the various local forestry organizations to the extent that greater appropriations have been made by the states, much-needed laws passed and enforced, and forest work increased in general to the degree that more trained foresters are available for the ruralist striving better to manage his forest lands.

The closest students of the work for the past three years have, of course, been state forest officials and other individuals whose task it is to write the final chapters of the book in years to come. With the seed of knowledge planted by The American Forestry Association, these men and women must bring it to fruition. Quite naturally, what some of them have to say at the close of the project is of great importance.

Harry Lee Baker, state forester of Florida, believes the work to be the "best possible medium through which people could be won over from their destructive practices. The work has resulted in a decidedly more favorable public sentiment." Fred B. Merrill, state forester of Mississippi, sees the work as "well received by every section of the state and accomplishing outstanding results in changing the public attitude toward forest fires." State Forester H. A. Smith, of South Carolina, declared that he considered the project "the outstanding feature of forestry education in America." Russell W. Bennett, president of the Florida Forestry Association, feels "confident that no amount of money expended in any other direction could have accomplished as much good for the future welfare of Florida."

As a result of the motion picture programs and lectures groups of boys have organized fire prevention and forestry clubs. This, more than any single thing, tends to show the influence of simple and direct education among forest folk. Too, it is a clear indication of the effectiveness of the project. These boys are the future citizens of the piney woods and their appreciation of tree and forest values, their realization that wholesale burning of the woods is destructive, will restore and maintain the woodlands of their communities and the South.

As a further result of the close contact between the educational units of the project and the rural districts more than 1,600 timberland owners have written to the headquarters of the Southern Forestry Educational Project for special information concerning forest fire and timber problems. Many of these owners had been burning their woods regularly for years. Through this contact they were put in touch with state officials and information supplied, and

often their lands placed under cooperative fire protection.

The total surface area of the fifteen Southern States is 598,455,000 acres, of which almost one-half, or 247,335,000 acres, are classed as lands unfit for agriculture and chiefly valuable for the growing of forests. This acreage has been one of the chief sources of natural wealth and human labor for the people of the South, whites and negroes alike. It has for years supplied the crop of lumber required by the people and industries in the states east of the Mississippi River. It is the foundation of two of its principal industries, lumbering and naval stores. The cutover lands, aggregating over 200,000,000 acres, form so large a part and are so extensively interwoven in the land economics of the South that their intelligent rehabilitation is essential to the future economic and social welfare of the South and the nation. Favorable climate, rapidity of tree growth, variety of forest products obtainable, close proximity by rail and water to the great wood-using centers of the country give these lands, if intelligently protected and managed, unequaled advantage in serving the South and the country.

But so long as the local custom of burning the woods every year prevails rehabilitation by both nature and man is held back because trees, forage and other forms of plant life cannot survive or compete indefinitely with repeated fires. In 1929 there were 135,000 forest fires in the United States which burned over 46,000,000 acres. Eighty-five per cent of these fires and ninety per cent of the area burned were in the Southern States. This record is typical of the annual burning of natural resources that takes place in the South every year due to the woods burning custom and ignorance of forest values.

Recognizing that the ignorance and habits prevailing throughout the rural South with respect to woods burning must be dispelled if the

South's chief natural resources are to be preserved and opportunities for protective rural endeavor made available, The American Forestry Association, in 1928, launched the Southern Forestry Educational Project. In cooperation with various forestry agencies in the farm states and with interested organizations and individuals, a fund of more than \$260,000 was raised. Primary emphasis has been placed upon reaching the rural school children and their teachers. Visual and personal contact methods of education have been employed through three principal mediums—traveling motor trucks especially designed and equipped with motion pictures, literature and qualified lecturers; educational exhibits illustrating the evil effect of woods burning; and enlisting the local cooperation of rural leaders.



W. C. McCormick, for the past three years Regional Director in charge of the Southern Forestry Educational Project, which was completed June 30, has been named Director of the Membership Department of the American Forestry Association. In his new office he will promote public interest to the end of increasing the scope and activities of the Association.

Formerly assistant state forester of North Carolina, Mr. McCormick was for a number of years connected with the United States Forest Service in fire-control work in the Pacific Northwest. It is in his public relations work, however, that he is best known, utilizing the mediums of motion pictures, exhibits and lectures to stimulate public sentiment in forest-fire prevention and practical forestry. Mr. McCormick is the author of a great many articles and stories dealing with the forests and forest conservation, and has supervised the production of a number of forestry educational films.—Editor.



EDITORIALS

The Sap Begins to Rise

HE WAS just a boy in a small town in South Carolina. In his whole school career he had shown no interest in learning and no ambition. His teachers despaired of him. They said he would never amount to anything. One afternoon there came to the schoolhouse a great red truck. On its sides was painted the slogan "Growing Children Need Growing Trees." A motion picture was given—a picture of trees and their service to mankind. The boy sat on a front seat. After the show he sought out the lecturer and plied him with many questions about trees, forestry and forest schools. "From that night," says the superintendent of the school, "the boy seemed to wake up." The sap had begun to rise. His school work improved and he was graduated later with good marks. Today the boy is at Clemson College, his future hitched to a star that shines through the trees.

A few months ago, AMERICAN FORESTS told the story of a group of boys in the little village of Jovita, Florida, who have grown up among the pine trees. Year after year they had seen ground fires blacken the woods. No one paid any attention to them, why should they? And then one day a red truck bearing the slogan "Growing Children Need Growing Trees" pulled up to their school and gave a picture. It was of trees and the evils of uncontrolled woods fires. The next

day these boys met in the rear of an old blacksmith shop and organized the Jovita Fire Club. The sap had begun to rise. That was only a few months ago. In the meantime the club has grown and latest reports are that it has put out over one hundred forest fires in that county. The enthusiasm and determination of the boys has fired the whole county, including grown-ups, with a spirit of forest protection.

On the editor's desk is a letter from a boy in southern Georgia. He had planned to take a forestry course at the state university. Reverses came to his father. College and scientific forestry training vanished as a morning mist. But the sap had risen in this boy. Undaunted, he is going to grow pine but first he must borrow the money to buy a few hundred acres. "These lands are ideal for growing slash pine," he writes, "and are also good corn-growing lands. I figure that I can make enough from corn planted between the pine rows to pay for the land before the young pines get in the way. I am sure that I could succeed if I could find someone to finance me."

These incidents, typical of many others that are coming to light, are the highest testimonials that can be paid The American Forestry Association's educational work in the South.

Timber Supply

AT THE recent hearing before the Timber Conservation Board, when the troubles of the lumber industry were aired at length, practically every spokesman of the industry laid great stress upon the country's reserve supply of timber and the length of time it will last. Figures were cited to show that at the present rate of cutting the forests of the Pacific Northwest will last for almost eighty years and that in the Southern States there is a reserve of pine sufficient to yield in perpetuity an annual cut almost equal to the country's present demand for southern pine. For the country as a whole, it was stated that the present national timber supply, without taking into consideration new growth, will sustain the present average rate of lumber production for sixty years. The object of these predictions is to lay at rest the idea of a timber famine, the fear of which in the public mind, the industry believes, has contributed to its present economic prostration.

Much as the industry is in need of constructive relief, there is, we believe, a danger of the industry's overplaying this phase of the situation. Actual facts in respect to timber supply and future lumber needs for the country as a whole are not available. If, as the Board was told, all past estimates have been out of line and have done great harm, present estimates may likewise be out of line and may do harm.

Some of the publicity emanating from the industry can hardly do otherwise than lead the public to believe that reforestation is an unnecessary and misspent endeavor and that the question of forest supply will take care of itself. To be responsible for the diversion of public belief along such a line would be the very worst thing that could happen to the industry. It would not only be a boomerang in years to come, but it might easily lead to a breakdown of the whole national movement for forest protection, equitable forest taxation and reforestation. Most certainly it would serve to alienate the public's interest and sympathy from the critical conditions with which the industry is now confronted.

After all, the question of whether the timber supply will last twenty, fifty or one hundred years is of minor importance in the immediate situation that faces the industry. The immediate, critical question is not how long the supply will last but rather how the industry, with the aid of the public, can put its machinery into order so as to carry and cut its timber with economy, efficiency and profit and at the same time provide for the future needs of the country in perpetuity. If there is as much timber as the lumbermen say there is and as much growth as the foresters say is possible, provision for the future ought not to be so difficult once the industry is put upon a sound, permanently operating basis.



Pothole Trout

The Lure of a Lava Lake
in the Oregon Cascades

By IRA N. GABRIELSON

For a quarter of a mile the water was so shallow it would scarcely float us. And there were no trout. Despite the discouraging outlook, we kept pushing along and finally came to a little point far across the lake projecting into the deep water. Here I landed while A. W. went out to try a spinner.

A. W. got a strike or two before he succeeded in landing a fish. I had the same experience. Those darned trout seemed to be having a good time at my expense. Time after time the water around my fly boiled as they rushed it, but the flick of my wrist brought no answering tug on the line. They must have been butting the fly with the top of their heads. At least I could feel them hit, but never could I hook one. At

last, as I was becoming thoroughly disgusted, one opened its mouth somewhere in the vicinity of the fly and it snapped in. Certainly I can account for hooking it in no other way. But hook it I did, and after fifteen or twenty more strikes I got another off the same point, both Eastern brooks about nine inches long. After that, nary another one could I get. A. W. was having the same luck, although he did manage to snake out a ten-inch rainbow.

Finally we gave up and after ferrying across some shallow water, A. W. landed me on a little lava island. Forthwith he proceeded to explore that end of the lake. It was a succession of shallows with irregular deep potholes in the lava, making fine shelter for trout. The riffle had gone, the water was clear, and the trout wary, a hard combination to beat. A. W. was working out in the middle of the lake trying spinners, trout-

IT WAS noon of a hot July day when "A. W." and I drove out to a grassy point on the shore of Sparks Lake, high on the backbone of the central Oregon Cascades. We were to meet a party of men there with supplies, to establish a crew for summer gopher work on the high meadows of the Deschutes National Forest. Carefully we scoured the lake shore and made the rounds of the camping places, but no sign of the crew. We did, however, discover a leaky boat around the point without oars or a visible proprietor. We immediately remedied these two defects—the first by making crude paddles, and the second by appointing ourselves proprietors at large. After this we made camp.

Feeling that it was too late to try the leaky boat on strange waters, we decided to fish around the shore a short distance. We tried several casts without luck. Just as we were ready to give up we came to a little cove. It was so small that A. W. passed it up entirely. I idly flicked a fly across the cove against a tiny floating jack pine. The water boiled, my fly disappeared, and after a few moments of real fight a twelve-inch rainbow was flopping about on the rocks. We were both surprised for we had always heard this called an Eastern brook trout lake. With renewed interest we continued fishing, but with no results, and at dark we were back in camp.

Still no sign of the crew, so we planned to arise early next morning and take advantage of our new positions as proprietors of that boat. Things went according to schedule and bright and early we shoved off.



High on the backbone of the central Oregon Cascades, Sparks Lake provided some unexpected excitement and disproved the bathing suit theory for trout fishermen.

erinos and flies of every description. On the rock I was doing the same without results. A huge boulder, lying in ten feet of water just at maximum range for a fly caster of my mediocre abilities, kept tempting me. Back on the summit of the rocky little island was a ragged fringe of tiny jack pines, and with every other cast I found it necessary to scramble painfully and carefully over those jagged lavas to untangle things. Finally I succeeded in getting my fly somewhere near the far side of that boulder and a speckled form flashed towards it, saw me, and turned back behind the rock.

I must have worked on that fish for an hour or more before things began to break for me. I had put on a tiny spinner and succeeded in getting behind a small bush out of sight of that fish. There were no fish brakes set this time or else they failed to work. In the crystal-clear water every move of the trout was visible and luckily I was in position to twitch the line just as he arrived. He was hooked, but hooked or not he had no intention of coming up on that rock where I was perched. He put up a pretty battle, every movement of which I could see. Seldom have I had such a chance to watch a trout fight.

When he quit I was still up against a tough problem. Keeping a stiff line I gradually picked my way along the edge of the rock until a little beach was reached. Climbing down, I carefully drew a twelve-inch Eastern brook out onto the gravel.

Four more Eastern brook came to my basket as a result of the lesson, but I am not telling how long it took nor how many flies and spinners I left in the whiskery fringe of trees along the top of that lava splinter. Altogether we had ten Eastern brook and two rainbows when we saw a car drive up to our camp across the lake, just at noon.

Returning, we found the bunch busy setting up their camp and fed the three of them on our trout. Those twelve fish disappeared by magic, and no one would admit he had enough. After dinner we turned in to finish camp, build a table, sand a fireplace and otherwise make it comfortable for a considerable stay.

That night around the campfire the conversation turned to fishing in general and to Sparks Lake in particular. After the condition of the lake, the fish, the shallows, the potholes, and what not had been discussed, Andy, one of the crew, said to me, "You've been over it now, what is the best way to fish it?"

"Huh!" I responded, thinking of those clumsy oars, the long stretches of shallow water and scattered potholes, "I'd put on a bathing suit and wade the cussed lake."

The next day being Sunday, everyone was free to mend clothes, wash, or do anything else their fancy dictated. Three of us decided to hike to Green Lake, look the country

over and perhaps fish a little in its intriguing waters.

We saw a beautiful, flower-bedecked country and found Green Lake to be perched at the lower end of the snowfields on the South Sister, one of Oregon's highest peaks. This little lake well deserves its name. It's absolutely impossible for water to be any greener. Altogether it has a most beautiful setting. On one side is the majestic bulk of South Sister, plowed and scarred with ice right to the edge of the basin in which the lake lies. On the other is the jagged, storm-lashed crest of Broken Top. The saddles between them were covered with great masses of lupines and heathers, with occasional clumps of spruce and pine for a background. We admired the setting and the scenery, but had no luck in the icy waters of the lake, though we tried everything we had.

Returning to camp, we found Andy with a beautiful case of

sunburn, a four-and-a-half-pound rainbow, together with some smaller fish and little to say about his experience. Little by little we learned why he had decided to remain behind.

It seemed that my idle suggestion of bathing suit fishing equipment had made a deep impression. No sooner were we out of sight that morning than Andy had donned a bathing suit, rigged a pole, and without stopping to think of any protection for his shoulders, started for the lake.

Arriving at the pothole area, he had the same experience as ours. Strike after strike without results. At length he succeeded in landing a small one and felt better. He then fished several

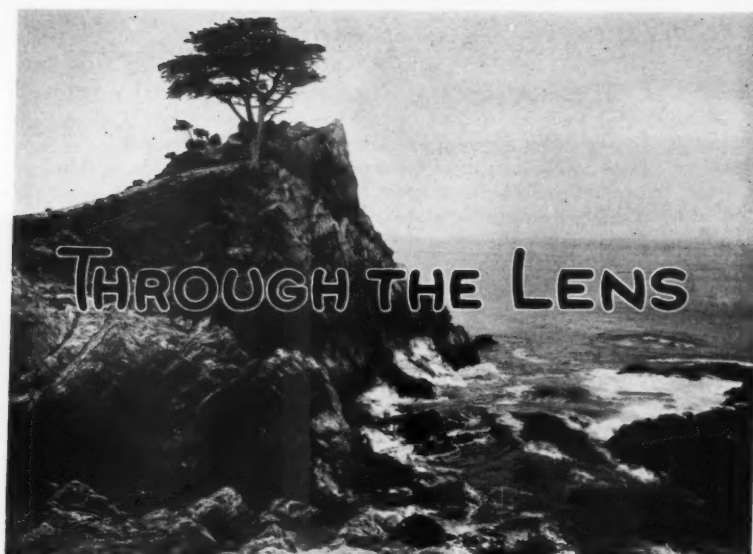
holes without luck and decided to change location. Cautiously wading up toward a darker spot in the water which indicated a hole, he cast a Black Gnat at it. With the aid of a gentle breeze it sailed to the far side and gently settled on the water. Bang! The water boiled, and an enormous shape shot into the air just as Andy set the hook securely.

The trout was big, fast and full of fight. Andy was perched insecurely on a point of lava rock at the very edge of the hole. He had no net. Back and forth and around and around went the trout while Andy tried to keep his balance and a taut line. Finally in one of its wild rushes, the trout broke water just in front of Andy, deluging him with water and then, while the excited, half-blinded fisherman was off balance, shot between his legs, whipped back into the pool and somehow upset him. Andy, fishpole, fishline and trout were all tumbled in one splashing, tangled mess into that hole. Somehow, in spite of all the excitement he managed to get a stiff line on the rainbow and land him before the battling trout could take advantage of the situation.

I don't think there is another fish that big in Sparks Lake, there wouldn't be room for two, but there are still some good enough to repay anyone who is foolish enough to consider trout fishing in a bathing suit.



"Food for the Gods indeed!" Big, fast and full of fight, you've done something when you've caught them—these sparklers of Sparks Lake—and, oh boy! how good they taste!



Fred H. Kiser

Short Lessons in Photography for the Outdoorsman

Conducted by Fred H. Kiser

Following the Yucca Trail

NOT always is it the thing we seek and finally find that gratifies our desire. Nine times out of ten it is the unexpected that brings the real result and so this happens more often than not in traveling about looking for picture material.

Last year I was unfortunate in photographing the yucca, for an assignment took me away from the Southland during most of the time they were in bloom. There is a slight difference with regard to the blooming period of these plants, depending on locality. Those growing on the Mojave

Desert, or in any flat, sandy area for that matter, bloom at least a week earlier than those located on the desert hills. Locale is also responsible for the complete disappearance of the bloom on the desert at the time it is just at its best in the hills. Those to come and go last are found invariably in the canyons of the Sierra Madre Range, due perhaps to somewhat cooler atmospheric conditions and a trifle more moisture in the soil. Anyway, as I had lost out completely in picturing yuccas everywhere last year, I made a resolution on New Year's Day, 1931, that nothing should interfere with



In the heart of the yucca forest.

© Fred H. Kiser

my getting them during the blooming period this season.

About the time I expected the blossom period in the Mojave, I checked up conditions by wire, and when found to be right, we made the trip and spent two days picturing the "Candles of the Lord." Just a small group of them or a single specimen may leave this name meaningless, but when they are massed, and at a distance, those growing on the mountain sides, particularly at sunset, certainly look the part in their glowing beauty.

Not altogether satisfied with the specimens on the Mojave, because they were small, we felt we would be disappointed unless we found a yucca "we had to look up to." Many motor and hiking miles were covered before we found such a specimen, but it was worth it, for on account of size, perfection of bloom, and general surroundings, it proved to be the best one of the four exposures made on the trip. On our return to headquarters we heard of several places in the hills where they grew to perfection, all of which we visited. Conservatively, we traveled fully four hundred miles during the three days of our second yucca hunt, during which time we only added two subjects to our collection. This does not mean they are scarce by any means, for they bountifully adorn the San Bernardino and the Sierra Madre Mountains from San Bernardino to the sea, but when you come to picture them, either individually or collectively in a general landscape setting, it is quite a different story.

Even with the time, effort and expense we had already put into our yucca venture, I had a feeling that much larger and finer specimens than any of those so far photographed could be found, remembering descriptions heard of "trees" that must have been at least fifteen feet high. Homeward bound, on what we decided to be our last day with the yuccas for the season, and in crossing a mountain divide, the road we were traveling made a sharp turn around a shelf of rock and afforded a viewpoint which proved to be a thriller. Almost directly below was a small valley, the floor of which was covered with thousands of white dots. As we descended, every twist in the road on the side-hill grade added to the glory of the lower perspective. Our "white dots" became elongated, and in making the last turn before coming out on a long level stretch of road, we were thrilled indeed, for

here grew "The Candle of the Lord" in its greatest profusion. The sun had set fully an hour before we arrived, and owing to the hazy atmosphere, we sensed to the full the meaning of the heavenly phrase which has given to this remarkable

and beautiful member of the desert forest its name. We were loath to leave the spot. It was warm, still and peaceful, and, although we were tired and quite some distance from home, we tarried long enough to feel the effect of the setting by moonlight, and it will ever be remembered as the most inspirational of all our travel experiences.

Twenty-five miles of travel brought us back to the "candle-lit" valley the next morning fully prepared to make as many photographs as our hearts desired. An ideal day developed for photographing, excepting the one prevailing interfering element which is usually in evidence in all unprotected areas—the wind. Soft cumulus clouds were floating in the sky most of the day, which added to our zest in carrying on our endeavors. We reveled in the beautiful yucca forest, the individual trees of which surpassed any and all our desires and hopes for large specimens. In height they grew from fifteen to thirty feet, and many of them had a girth measurement of



© Fred H. Kiser

The Spanish dagger (*Yucca whipplei*), largest of all this beautiful clan, grows only on the ocean side of the mountains.

fourteen inches. Their hundreds of bell-shaped flowers, congested into heavy panicles from two to four feet long standing out against a cloud-flecked sky or some pleasing background, formed a most unusual and harmonious composition.

Yucca whipplei (Spanish dagger), illustrated on this page, is the largest of the yucca trees, and grows only on the ocean side of the mountains, extending along the south side of the Sierra Madre Range.

Yucca mohavensis is a smaller variety growing in the San Jacinto and Santa Rosa Mountains and on to north Lower California, from the extreme west to the San Bernardino Valley, on the coast near San Diego, and east to Arizona and Nevada.

Yucca baccata (Spanish bayonet) is a distinct type, low growing and of irregular form, and is practically confined to the Santa Rosa and San Jacinto Mountain ranges.

Yucca brevifolia, sometimes referred to as *Yucca arborescens*, commonly called the Joshua Tree, is the "cave man" of the species, as it is larger and perhaps throws as many weird forms in habit of growth as (*Continuing on page 494*)

A Railroad Wars on Fire

By HARRY POLLARD

WITH a considerable portion of its 9,000 miles of railroad lines on the Pacific Coast built through the timbered regions of California and Oregon, the Southern Pacific Company has, during more than half a century, developed a fire-prevention and fire-fighting organization that has not only afforded protection to its own properties, but which has also given effective cooperation to the United States Forest Service in checking fire losses in the National Forests.

Four especially equipped fire-fighting trains held in constant readiness during the summer months, and dozens of strategically located water tank cars, a lookout station, and thoroughly drilled fire-fighting units are but a few of the activities carried on by the railroad in its war against forest fires. There is careful "housekeeping" along its right-of-way, and a continuous campaign of reminding the traveling public of the dangers of throwing aside lighted matches or burning tobacco.

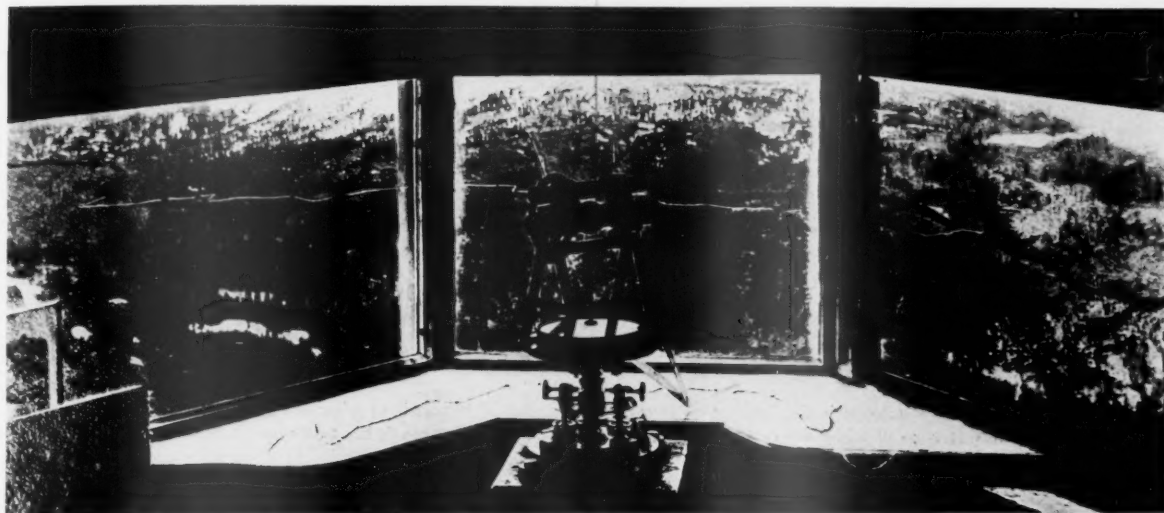
Probably the most unusual feature of this work was the establishment, as long ago as 1909, of a lookout station on Red Mountain in the Sierra Nevadas of California. Here night and day watch is kept over the timber areas during the

fire season. The primary function of this observatory is to detect fires in or adjacent to the eighteen miles of wooden snowsheds that cover the railroad tracks at their highest elevation in crossing the mountains. The sheds provide the means of keeping the tracks clear of snow during the winter, but in the summer they are constantly subjected to damage by fire, either due to causes arising from trains operating through them, or from forest or brush fires.

Installed in the lookout cabin is an ingenious device which enables the observer to determine within a few feet the location of a column of smoke seen at a distance of from four to five miles. To an ordinary engineer's transit is rigidly attached an aluminum indicator which moves over a circular topographic table chart on which is etched in copper a line representing the exact course followed by the snowsheds over the mountain summit. On the chart is also indicated, in various colored enamels, the location of all stations, mileposts, fire-alarm and telegraph boxes in their relation to the sheds. Traced on the large bay window forming the front of the cabin, is a line which also depicts the route of the snowsheds. Looking through the transit telescope the watchman sets the cross hairs in the finder on



This is one of the four especially equipped fire-fighting trains which are available night and day to combat fires in the forest country adjacent to the railroad line over the Sierra Nevada Mountains in California.



This device is used by the Southern Pacific in locating fires at a distance of from one to ten miles. On the table in front of the transit is a topographical map showing the railroad line in the mountain region. A pointer moves directly over the chart, coinciding with the axis of the transit as it is swung from side to side. Traced on the window facing the transit is a line duplicating the course of the railroad. Through the telescope transit the watcher sets the cross hairs in the finder on a direct line with the distant fire. If they also intersect the line on the window, he knows the fire is on the railroad, or he is able to determine its approximate location with regard to the tracks, from where the pointer rests on the topographical chart. Then he immediately telephones the alarm to the railroad's fire fighters on the job.

a line with the smoke seen in the distance. If the cross hairs intersect the line on the window he knows the fire is in the sheds. Or he can determine if the smoke is coming from above or below the sheds. The approximate location of the fire is determined by a glance at where the aluminum indicator rests on the topographic chart. Through telephone connections the watchman sends out the alarm which quickly gets the railroad and Forest Service forces on the job.

As early as 1870 the builders of this western link of the first transcontinental railroad realized that extra precautions would have to be taken to protect the snow sheds from destruction by fire and at that time the first fire train was placed in service. There are now four of these trains stationed at strategic points along the line over the Sierra Nevadas. An-

other is held for emergency use at Sacramento. The locomotives of these trains are equipped with duplex pumps having a capacity of 300 gallons a minute. To each locomotive is attached two tank cars with a combined capacity of 12,500 gallons of water. Each train also has 1,000 feet of two and one-half-inch standard fire hose, two chemical extinguishers, fire ladders, portable telephones and a large

supply of brush-hooks, axes, shovels, saws and lanterns. The long hose makes it possible to fight fires in the timber at considerable distance from the railroad tracks. There are two portable nozzles attached to the front of each locomotive, and with two lines from the tank cars the fire-train crew can throw four streams of water at one time.

These trains are kept under steam at all times during the summer months and it takes only two



The fire trains maintained for forest protection in the mountains are equipped with sufficient hose so that the road men can be of help to the Forest Service forces in fighting fires, even when they are at considerable distance from the tracks.



The railroad watchman in this lookout cabin commands a view of hundreds of miles of forest country and his duty it is to give the alarm when the first sign of fire is seen through his telescope or binoculars.

to five minutes to get one of them under way. The engines are equipped with sirens which scream their warning as the train speeds over the rails to the fire. All other traffic is sidetracked from the main line. It is the proud boast of the train crews that they have never yet had to back away from a blaze, and the losses have been measured by the time that elapses before the trains could get to the scene.

To further insure against fire in the forests, the railroad company has fifty or more tank cars distributed at convenient locations on spur tracks in the mountains of California and Oregon. These cars are especially equipped for emergency use and a test once a week insures that they are in good working condition. Piping of each car is arranged so that a locomotive can furnish steam for the operation of a duplex pump and each car has 500 feet or more of hose and all tools to give it complete fire-fighting equipment.

Not only do these fire trains and tank cars give protection to the timber country and the railroad property, but on many occasions they have been rushed to the rescue of small mountain towns threatened with destruction by fire. The town of Colfax, high in the Sierra Nevada Mountains, and composed mostly of wooden frame buildings, averted serious fire losses because of the extra water supply made available from tank cars side-tracked in the local railroad yard. It was said to be the fourth time the railroad's fire-fighting facilities had been the means of saving that particular town.

The watchword of the railroad's fire department is *prevention*. There are fire chiefs, fire brigades and fire com-

panies located in six Western States. It is their duty, in addition to extinguishing fires, to see that shop, yard and track forces practice "good housekeeping" and that the premises are kept clear of rubbish and inflammable materials.

All locomotives operating through the timber country are equipped with devices for preventing the escape of sparks from smokestacks, and with apparatus consisting of an inspirator and one hundred feet of two-inch rubber-lined hose so that in an emergency each locomotive becomes an efficient fire-fighting unit. Fire lines six feet wide are plowed on each side of the track and the remainder of the right-of-way is cleared of grass by burning—under the supervision of section gangs—at the approach of summer. On the heavy mountain grades, where the hard application of brakes is often necessary, sparks are at times created by friction. These sparks seldom cause damage but they are closely watched, nevertheless. A man supplied with a pack tank filled with water follows close behind each train on a motor car through the forest country. He can quickly extinguish any small blaze. When his motor car falls too far behind the fast-moving train, the trail is picked up by another watchman. Cooperating further with the Government and other agencies in combating fires, all Southern Pacific train and engine crews working in these regions are instructed to be constantly on the lookout for signs of fires, and placards are conspicuously posted in all trains warning passengers of the danger of throwing matches or burning tobacco from car windows or observation platforms.

THE TREE

*I am the thing the years have made,
Their every mood is part of me;
I am the warmth of summer days,
I am their child, the swaying tree.*

*I hold communion with the stars,
I stir to greet the grey of dawn;
And stand as I have stood the while
A hundred thousand such were born.*

*I am the tree the years have made,
The product of their soil and sun;
I am the wealth of all their toil,
The greatest thing the years have done.*

*The centuries gave birth to me,
I am their best, I am their crown;
I rule the streams, I feed the seas—
Think twice before you cut me down.*

—Arthur R. Macdougall, Jr.

The Threat of the Dutch Elm Disease

Foresters, Pathologists and Tree Lovers Search for Infections
After Discovery in Ohio

By R. KENT BEATTIE

THE Dutch elm disease was found in America last summer for the first time. Three trees were located at Cleveland and one at Cincinnati, Ohio, and the disease was eradicated. Immediately after its discovery a thorough search was made among the elm shade trees in the vicinity of the affected ones but no others were discovered. Similar search was made in neighboring towns and in the woods; elm lumber was examined at numerous mills in the Ohio region. Cultures were made from every wilting elm and from every elm with brown-stained sapwood that was discovered. Foresters, tree surgeons, pathologists and tree lovers in other states were stimulated to hunt for the disease. But none but the four infected trees have yet been found.

In Europe, on the contrary, this disease is widespread. First found in Holland in 1919, it has spread through Norway, Belgium, France and into Italy. Thus it is apparent that the organism that produces this disease can

live under a wide range of climatic conditions. For miles around the famous Versailles Palace, in France, there are glorious plantings of old elms, which form the principal feature of the landscape. Last summer the writer saw the Dutch elm disease killing these fine old elms.

It is not known how this disease came to America. In Europe, it is believed that its spores are carried by at least two kinds of beetles, but it is difficult to understand how they could bring it to this country. The disease does occur over there in nursery stock, but the importation records show that no elm trees have come from Europe to Ohio since the disease was first found in Holland. The known

facts do not explain its introduction. Further study of the disease and of its transmission is imperative.

But first of all, if there are more affected trees in the United States, they must be found at once. To do this the help of foresters, tree surgeons, pathologists, and tree lovers everywhere is needed. Scouts sent out by the federal government and the states concerned cannot hope to inspect every elm in the nation. Energetic cooperation is therefore needed so that if there are other diseased trees in this country they will be found while there may yet be time to stamp out

the disease.

Watch the elm trees around you this summer. Look for signs of wilting twigs. Examine the inside of the twigs for brown stains in the sapwood and watch elm lumber for the same thing. Unfortunately this disease cannot be determined definitely in the field. Specimens must be sent to the laboratory for culturing. If, therefore, there are any signs of wilting twigs or browned sap-



Fine old elms, not far from Versailles, France, attacked by the Dutch elm disease and photographed last summer.

wood among your elms, collect freshly affected twigs eight or ten inches long, wrap them well in paper and mail them to the Dutch Elm Disease Laboratory, care Ohio Agricultural Experiment Station, Wooster, Ohio.

While the Dutch elm disease is as yet a shade-tree problem in the United States, foresters and those occupied in the woods should watch carefully the wild trees also for symptoms. It is very important that a careful record should be sent with each specimen as to the exact location of the tree from which it was taken. (As this magazine goes to press two more trees were reported affected in Cleveland. —Editor.)

A FOREST PAGE FOR BOYS AND GIRLS

Conducted by
WAKELIN MCNEEL

HIGH in the list of the rights that belong to every boy and girl is the opportunity for adventure. In the phrase "find it" is the charm of adventure. It dominated the heart of Father Marquette and impelled him to penetrate the unknown wilderness. Burbank felt its power and made nature produce many new varieties of beauty. In the field of wood chemistry its power is making the utilization of wood as important a phase of forestry as the growing of trees, and a long list of articles from clothes to fountain pens has come forth. "Find it" has a similar persuasive charm in the field of nature appreciation. Many feel that spring has not fully arrived until a bird's nest has been discovered and a trout caught. The more unexpected the discovery the greater the thrill. When a humming bird lighted on the end of my fly rod and remained there long enough to afford a better observation than a museum specimen provides, I felt the supreme thrill of the season had arrived and winter could come anytime without a complaint from me.

What kind of a fisherman is he whose rod becomes the roosting place for birds? It just happened, that's all. It was one of those unusual events that make a fishing trip a real adventure despite an empty creel at dusk.

We all have in our list of acquaintances some fellows who ever get so intent on their fishing that even the incomparable song of the hermit thrush escapes their notice. Trout fishing is a splendid adventure, but not for such. On the other hand, we know those who have the happy faculty of complete surrender to their surroundings. They wade the difficult bottoms with unconscious ease, miss the overhanging boughs with uncanny accuracy, and often at dusk the creel reveals a happy surprise. I know a con-

scientious soul who exceeded the bag limit in such a complete state of self-abandonment. We have gone a long way in real enjoyment when we have learned to surrender ourselves completely to the hour and the scene. In such a mood we learn secrets that otherwise escape our keenest scrutiny.

A year ago a group of boys taking forestry as a 4-H Club project had a real adventure. At an early hour they boarded a logging train to visit a forest where selective logging was carried on. As the term implies, selective logging is the picking out of certain trees for the logger's ax. A minimum diameter is determined below which it is unprofitable to cut. The chosen trees are felled and the logs skidded with as much care as can wisely be given to the operation in order to inflict as little damage as possible to their companions left standing. The tops of the felled trees

are cut up, the thickest branches corded for chemical wood while the smaller branches are "lopped" close to the ground to hasten decay and reduce the fire hazard. If a real job is done, defective and ill-shaped trees are removed to provide air and soil space for the more promising trees. Twenty years later the loggers will



Finding adventure in the woods—unexpectedly these boys on a hike discovered a forest fire, which they fell to work and extinguished.

make a similar invasion and remove the trees that have grown to merchantable size. The trip provided a fine example of how a forest can be conserved by wise use.

It is clear that selective logging is more expensive than the "after-us-the-deluge" method so generally employed. One regrets that economic conditions and conscience were such that this conservative method could not have been employed in the early days when so much of our forested land was laid bare by ax and subsequent fires. What a wealth of forests would have been the heritage of the future

guardians and administrators of our forests. Our guide on this trip was a cruiser for the lumber company—the man who selected and blazed the trees to be felled. He possessed that mysterious faculty for direction, distance and tree measurement that won the admiration of the gang, and which comes only with living in the woods. He walked the woods with the ease of an Indian and his straight, flinty gaze stared one out of countenance. One might think that he had no soul but when he opened up on birds we knew differently. He knew and loved birds and the song of the hermit thrush or the harsh call of a crested flycatcher caused frequent digressions in his conversation to tell some peculiarity about the birds.

The thrill of the day came in a hike to a heron rookery. The dinner at the logging camp when the boys seated themselves six inches from the table didn't compare with it. Then through the woods, skirting marshes and stopping at a lake long enough for our guide to demonstrate that a loon aware of danger could not be shot at a distance of a quarter of a mile. A loon's cry was heard and soon we discovered the bird resting on the undisturbed surface of the lake. The guide answered the call and then stepped out into the open. The loon faced about, fidgeted for a minute as if uncertain whether to fly or remain, and finally came to a position facing the group. The guide pulled his revolver from the holster and fired, after taking a momentary aim. The loon disappeared and in an instant the splash of a bullet could be seen within a foot of where he rested?

"You got him," shouted one of the boys in half delight.

"Watch!" cautioned the guide.

In a few minutes the loon appeared two hundred feet farther on, remained for a moment and disappeared again. "Got him?" continued the guide. "You can't kill a loon a quarter of a mile away after it knows of your presence and is on its guard." A heron rookery is the nesting place of a large number of herons. The heron is not a sociable bird generally, but in the rearing of its young it seems to enjoy companionship of other herons. They select the tallest trees within flying range of feeding grounds. We counted eighty-four nests built in seven hard maples, the trees so close together that their branches interlocked. In one tree alone we counted twenty-four nests—crude affairs made of sticks so loosely put together that one wonders how they hold the eggs or withstand the winds. The ground beneath was white with the excreta of birds and was littered with the carcasses of fish. We made the discovery that the fish were suckers. The remains of one hundred fish were laid out and all proved to be suckers. Does the heron prefer a sucker diet, or are game fish too quick for his attack? We could easily see how the herons could select the tallest trees in the sheltered slope of a ridge, but where did they get their training as foresters that guide them in the selection of such sound trees with clear boles?

There are so many mysteries about birds that even expert ornithologists have not yet fathomed. Why does the chipping sparrow use a hair mattress while the wren must have

a feather one? Why must the crested flycatcher have a cast-off snake skin in the nest before an egg is laid? Is the cow bird devoid of maternal instinct, or did nature just neglect to endow it with the ability to build nests? Else why should that bird lay an egg in the nest of other birds and thrust upon the unwary the work of hatching and rearing its young often at a sacrifice of rearing their own? Why does the long-billed wren build a number of decoy nests around the one it finally uses to hatch and rear its young?

"Nature knows what she is about," continued the guide. "When anyone tells you the heron is a destroyer of game fish, tell them what you saw today."

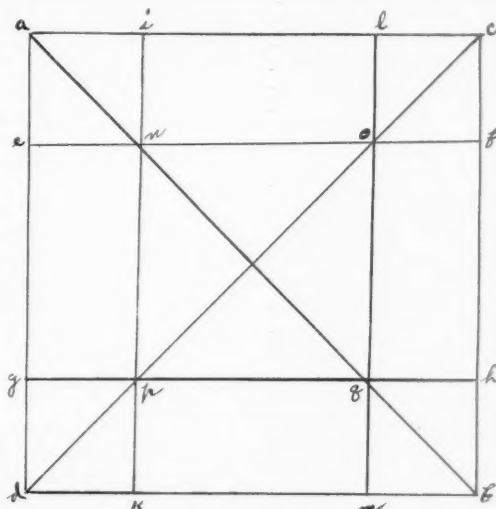
It was on this trip that a boy boiled water over fire without using the customary basin. He was given a half

hour in which to build a fire, improvise his receptacle and bring an egg to a hard-boiled condition. The lad set to work, built a "log-cabin" fire out of hard wood to provide quickly the best coals. While the fire was burning he gathered stones and piled them in the center of his fire. This done, he cut a trough from an eight-inch trunk of a tree with a hatchet. This he filled with water. By that time the stones were heated. With a forked stick he put a few of the stones into the water, removing them to add a few more. Soon he had the water heated to the boiling point. He dropped in the egg and added more stones to keep up the temperature. In twenty-three and a half minutes the egg was cooked. It is noteworthy that the lad selected round, hard stones that did not burst when placed in the water, and avoided sandstones that break to pieces when heated or when dropped into the water.

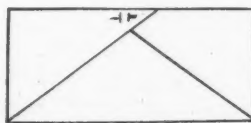
Another practical stunt many boys will enjoy doing is boiling water in a bark kettle. A thin, clear sheet of paper birch bark is best. To try it cut out a piece of

paper twelve inches square and fold it as directed, using the diagram as your guide. First fold along *ab*. Now open and fold along *cd*. This gives you diagonal creases. Turn the sheet over and fold in turn along *ef*, *gh*, *ik*, *lm*, making each crease three and a half inches from the margin. The purpose of the creases is to make it easy to form the basin. Now place *i* and *e* together; *a* will be thrown outward. Fold *a* to the right and hold it there. Bring *l* and *f* together and fold *c* to the left. *C* and *a* will overlap and are fastened by a pin, or in case of bark by a skewer made from a twig. Do the same at corners *b* and *d*. The crease *no*, *pq*, *oq* and *np* are then folded inward and you have a basin three and a half inches deep and five inches square. Place your paper kettle on a suitable stand, fill it with water and place over a gas jet so that the flame will play on the bottom and not on the sides. If the flame touches the paper above the water line, away goes the basin and you have water to mop up.

The paper does not scorch because the water absorbs the heat instantly. In case of the bark kettle the material must be free from cracks, holes, eyes and curves. Place the vessel directly on live coals and cover all around the bottom and up the sides with ashes.



Can you make a water-tight basin? This diagram will show you just how to fold in the paper. The view below shows one end.



SAVE THE TRUMPETER SWAN

(Continued from page 478)

of tules with great rapidity. In getting over obstructing mats of rushes they made good use of their toenails. At length a cygnet, in trying to dive, became entangled in some rotting tule stems and I managed to catch it.

In hand, the day-old trumpeter was found to be about the size of a female green-winged teal duck. When wet, the fine down appeared to have a grayish tinge, but when dry it was pure white. The bill and feet were pale flesh color, while the tip of the bill and the tip of the toenail had a slight yellowish cast. The eye was a rich dark brown, appearing black, but this was the only black visible. One of the other cygnets became weary of swimming about and attempted to elude me by going ashore and hiding in the salt grass. When on land, even in the short grass, the youngster made good progress, traveling a distance of six feet in twenty seconds.

During the first few days after the swans were hatched, ravens made repeated efforts to capture the young. However, they were thwarted through the combined efforts of the parent swans and their human guardian. By the time the swans were three or four days old they were well able to take care of themselves.

Although the entire family, including the male parent, returned each evening to the nest where they passed the night, the daylight hours were spent foraging in the shallow algae-covered water of the lake. The favorite food of the adult birds was the sprouting white underwater stalk of the tule which was secured by tipping up and reaching down with their long, muscular necks. In pulling up such tender, sprouting tule stalks, the parents often dislodged water boatmen and other aquatic insects that had taken refuge in the algae and moss. Such insects were instantly gobbled up by the cygnets, which were soon leading instead of following their parents about. During the first ten days of their lives I found that insect food formed the major portion of their diet. However, as they grew they began to pick up more and more of the bits of vegetation that had been pulled up and loosened by their parents.

When the young swans were ten days old, their father took them on an exploring expedition to a little pond adjacent to Trumpeter Lake. In order to reach this pond the whole family had to travel overland for a distance of about seventy yards. I feared that in doing this they might fall victim to some wily coyote. Making a detour behind a ridge and, keeping out of sight, I lay down on my stomach and crawled as carefully as I could up toward the family, which at that time was busily catching grasshoppers on a little sagebrush flat about fifty feet from the margin of the lake. I was unable to get within fifty yards of the swans before the father detected my presence. While the cygnets were busy feeding, the parents kept a sharp watch for any approaching danger. The long neck of the father would be raised like a periscope every half minute or so, and from the viewpoint thus obtained he was able to watch every avenue of approach. After making several unsuccessful attempts, I came to the conclusion that the danger from coyotes was relatively small, since the swans were careful to keep entirely out in the open where they could not be captured through sudden surprise. Whenever danger threatened, the father immediately gave a warning call which sent the mother and the cygnets hurrying into the lake. When danger from the air threatened, as in the case of a raven or eagle, the parent swans gathered their young together in a compact flock, the mother remaining close to and defending them from attack on one side and the father protecting them from the other side.

By the last of June the young swans were as large as a female mallard duck and able to take care of themselves.

Mr. and Mrs. Ben Arnold, who occupied the ranger station at Tower Junction, had taken a deep interest in the welfare

of the swans and they agreed to keep watch over them after we were forced to leave. The young swans prospered and grew daily. Everything went well until about the middle of August when they mysteriously began to disappear, one by one. Both Mr. and Mrs. Arnold spent hours watching the lake in an effort to locate the cause. A careful search of the region adjacent to the lake shore failed to reveal scattered feathers or other signs of the young having been captured by coyotes. Nor were there any indications of attacks by eagles or other birds of prey. Finally a clue was obtained through the disappearance of a number of young ducks and mudhens that were devoured by a family of river otters which had taken possession of Trumpeter Lake.

Examination of food remains found in the droppings of the otters showed that young of all species of waterfowl nesting in the lake were eaten, as well as full-grown muskrats. At my request, samples of the otter droppings were sent to Berkeley, where I examined them in the laboratory. I was unable to find any positive evidence or trace of the young swans. However, the observations made by Mr. and Mrs. Arnold strongly indicated that the otters were the culprits. It was found that while the otters were small the adults were living almost entirely on nymphs of the dragonfly which were especially abundant in the lake, and only a few young birds were taken. As the otters grew their food requirements increased and the supply at the same time decreased. This would explain how the young swans might have escaped when they were small and still have been captured and eaten as food grew scarcer later in the season.

One of the young swans survived, and the last word that we had just prior to the freeze-up in the fall of 1930 was that the parent birds, realizing that migration time was at hand, were making frantic efforts to encourage their lone offspring to fly south with them. However, the cygnet seemed loath to depart, and, in spite of all of the coaxing and solicitation of his parents, remained at Trumpeter Lake.

Major Allan Brooks has pointed out that the preservation of the trumpeter swan in Yellowstone National Park will be complicated and made difficult because of the fact that in a National Park all animals are given protection and the full complement of natural enemies of the swan are therefore present. However, about the only places where we can expect to keep trumpeter swans in a wild natural condition are in Yellowstone and Glacier National Parks. Our experience in Yellowstone last year resulted in the discovery that at least four pairs of trumpeter swans were definitely known to have bred in that region during 1930. The number of young swans that were raised to maturity was disappointingly small, for although five and six eggs were known to have been laid in two cases, only two young, and in the other two cases only a single cygnet, were raised. Mr. Wright has pointed out that the trumpeter swan is a long-lived species, sometimes reaching an age comparable to that of man. He has suggested that perhaps under normal conditions only one or two young swans out of a brood of five or six may reach maturity each season, and that perhaps this would be sufficient to keep up the swan population.

Although the problem of saving the trumpeter swan is confessedly a difficult one, the interest that has been taken by various officials of the National Park Service, together with the progress that has been made in discovering the enemies and needs of the bird, encourages us to redouble our efforts. It is our belief that the trumpeter swan is a species that has reached a critical stage of existence. We believe that if a "do nothing" attitude prevails, this magnificent bird will soon be numbered with the passenger pigeon and other extinct species.

The Flower of Unknown Quantity

By WINTON WEYDEMEYER

With Photographs by the Author

IF ONE should by chance resent the devitalizing touch upon vivid flowers of unemotive mathematical terms, come to Montana and delight in beargrass for twenty years; then, if still unsatisfied with the above title, choose a better one. In its very name *Xerophyllum tenax* begins and ends with the symbol of the unknown quantity; and in the beginning and the ending of a season's blossoming it stirs in the interest of a nature lover the queries: "How much beargrass will bloom this year?" and "will there be more or fewer flowers next year?"

To see this striking flower in its natural surroundings one must come to the great mountains of the Northwest. In extreme northwestern Montana it grows in its greatest abundance. Spreading over entire mountains of the Whitefish Range, it reaches into Canada and Glacier Park, and in local, scattered patches southward through the Rockies to Wyoming. Westward it extends its growth to northern Idaho, and reappears on some of the higher mountains of the Pacific coast. The exact limits of its range are not definitely known.

When in May and June the deep-piled snow of the Whitefish Range softens and settles, and dripping shrubs and saturated plants awoken from their seven months quiescence, conspicuous among them are blue-green domes of long, sharp-edged grasslike leaves that rise thickly from the frostless ground at a common center, and curve outward and downward on all sides. Covering a circle sometimes as great as four feet in diameter, the living leaves conceal a mat of withered, straw-like blades, remnants of past seasons' exuberance, indicating persistent life beneath the ground.

The season grows. Higher peaks turn from white to gray and green. From the short, woody rhizomes of the bear-

grass the soluble minerals of the alpine soil pass to the leaves, and the commonplace miracle of plant food manufacture occurs. And now the nature lover watches, and asks, "How much of the grass will blossom?"

Perhaps it is an off year. If so, the watcher may climb mountain after mountain, and traverse long ranges from valley to valley, until winter snows again cover the grassy domes, yet not see a single flower arise from the growing leaves; or find only a few hundred cones scattered apart like milestones. New blades creep from the center of the tuft, and some of the oldest outer ones wither and droop; but as though every plant over three million acres of wilderness had agreed upon a year's vacation from the task of blossoming, the flower of unknown quantity does not exist.

But perhaps it is a season of disagreement. Then the watcher in late June thrills to the sight of round lances suddenly upthrust from some of the clumps of grass. Stiff, hollow stems these are, rising swiftly to a height of two to four feet, and swelling to a thickness of an inch or more. Grasslike leaves, stiffer and shorter than those in the basal clump, grow from the stalk, becoming shorter with the increase in height, the uppermost ones being reduced to mere bristlelike bracts. The topmost two or three inches of the stalk is swollen to a cylinder of creamy beads.

Now the lower beads enlarge and burst, flinging out star-shaped white flowers on long, delicate stems. Like a slow wave the spread of blossoms run up the stalk, the pedicles becoming longer with the rise. Meanwhile the stalk grows along the length of the raceme, lifting the crowning buds higher and giving wider spacing to the lower flowers. At mid-tide of blossoming the heads present their most beautiful shape—a wide, rounded cone of densely set flowers, tapering to the stalk below with



Whitefish Range country. In this wilderness of Montana beargrass grows in its greatest abundance.

more scattered, upward-reaching stars, and crowned with a tiny cap of unopened buds. The larger racemes are now the size of a football, and some of them are rounded to nearly that shape.

The last cap of buds unfolds more slowly, and the stalk continues to lengthen. When flowering is ended and the seeds commence to form, many of the open racemes are more than twenty inches long. The final tall seed-stalks stand stiff and firm until broken down by bears or wind or winter snow.

In the years of disagreement among the plants not all will lift these snowy lances. Perhaps over many mountains the scattered flowers will be well distributed. Or it may be that one mountainside becomes well whitened, while another one nearby, thickly carpeted with the slippery grass, shows scarcely a solitary head.

No man can point in early spring to a beargrass clump and foretell its blossoming or its quietism.

Now if the nature lover watches a million acres of beargrass country for a score of years or longer, he may perhaps witness the miracle of almost complete blossoming. Only once during the writer's lifetime has this happened in the Whitefish Range country. That was in June and July of 1928. From its lowest range in the transition zone forests at thirty-two hundred feet in altitude, to near timberline at the tops of the highest mountains; on open slides and rocky cliffs and in the dense shade of damp forests of lodgepole and white pine, Douglas fir and western larch, giant arborvitae and Engelmann spruce and alpine fir, wherever a few clumps of beargrass grew the striking cones appeared. Some mysterious impulse had stirred a million billion hidden rhizomes, and with sudden energy they thrust up ten million billion

stalks of growing buds. For very few were satisfied with the metabolizing of a single flower head; most of them formed from four to twelve or more, and from some clumps of leaves rose thirty-five or forty four-foot stalks of blossoms.

Over the vast wilderness habitat of beargrass in the Whitefish Range and adjacent western mountains, eastward through much of Glacier Park and northward into Canada the incomparable display of the showy racemes extended. Entire mountainsides grew white. Unsombering cones dotted endless miles of shaded forest undergrowth. Near meadow camping grounds the long-stalked heads shone like gigantic dim candles in the night. Like the snow-line in spring, the white carpet climbed slowly upward, commencing the first week of June in its lowest range, and not fading from the high mountain peaks until late August. Perhaps fifteen or twenty years may pass before this plant presents so great a flower show again. Who can tell? What is this eccentric plant? What sum of nat-



Young heads that hide an old beargrass mystery.

ural influences determines its blossoming or the impassive latency of its flowers? Systematic botanists call it *Xeorophyllum tenax*, a member of the bunch-flower family, *Melanthaceae*. Western people who know it call it beargrass, for in early spring hungry bears eat the nutritious rhizomes and the succulent young flower stalks; or squaw grass, or Indian basket grass, as its tough, pliable leaves are woven into strong Indian baskets. But by one who roams its range in lean years and in affluent ones, keenly disappointed when no white cones gleam and thrilled always by their profuse appearance—yet never able to predict with certainty the extent of a season's blossoming—it may well be remembered also as "the flower of unknown quantity."

FOLLOWING THE YUCCA TRAIL

(Continued from page 485)

any of the desert flora. These trees with their open crowns grow from sixteen to thirty feet high, with columnar trunks from twelve to twenty inches in diameter. Their tooth-edged leaves are from six to nine inches long, and their stubby and congested bloom panicles are from six to fourteen inches in length. Their growing range lies in the Mojave Desert and San Jacinto Mountains. Victorville, California, is really the center of the Joshua Forest, and it is widely distributed from that point north to east Kern and Inyo counties, California, then east to Utah. There are about twenty distinct types in the yucca family and the foregoing described varieties comprise all the members of the western group. While their characteristics of growth are quite different, the color of the blossoms is about the same, being a rich cream, the flower panicles as a whole throwing a slight sheen of light green.

The leaves of the *Yucca whipplei*, *mohavensis* and *baccata* are long and narrow, all having treacherous and deceiving points as sharp as those of the smallest needle. These points are treacherous because they are poisonous. As evidence of our recent "yucca trip," I carried a black-and-blue mark on my arm for three weeks as a result of being stuck by one of these needles. They are deceiving because the leaves are peculiarly color-marked. At first glance the ends of the leaves appear to be rounded and blunt, but upon close examination a fine protruding gray needle can be seen.

Fortunately, the yucca forest enjoys the protecting hand of the law in all states, or else in a few years we would not be permitted to enjoy their magnificence. The hands of vandals and greedy flower pickers would soon exterminate them. After a growth of from three to five years the *whipplei* and *mohavensis* plants throw up a bloom spike on which the blossoms come and go in ten days' time, once each year, after which the plant dies. Long before this occurs, however, the parent plant develops from one to a dozen offshoots of different ages which eventually take their stand and show beautiful colors. Thus the cycle of life goes on and on.

When photographing a yucca bloom against a blank sky, a color screen, preferably K-2, and a tripod are absolutely necessary, for at least a full second exposure will be required at stop 32 or 64, depending on the time of day the work is done. If you are working at a time when there are clouds in the sky, or in a direction that will place the bloom between you and a background, a color screen will not be needed, and instantaneous exposures can be made with good results.

Whether you enjoy the desert as a whole, or not, the sight of a desert forest in bloom, such as the yuccas, is one never to be forgotten. If you are luckily able to register photographically some of its beautiful blossoms under favorable atmospheric conditions, I have no hesitancy in saying the pictures will top the list of your best subjects.



Genius

Woman (to artist): "As I walked through the woods I beheld a glorious sunset—flaming, gorgeous colors, brilliant light effects, nature in all her magnificent array. And I thought it was like looking at one of your paintings!"

Artist: "Yes, madam, nature is catching up."—*College Humor*.

We Moderns

The modern idea of roughing it is to have no radio in the camp.—*Detroit Free Press*.

The Long and Short of It

Lady huntress (to hardware clerk): "I am going deer hunting and I want two boxes of 22-gauge shells."

Clerk: "Longs or shorts, mam?"

Lady huntress: "Long ones. Still—I'd better have one box of short ones, as I might see a deer up close."—*Helen C. Payne*.

Sapp and Wood

The Florida journal of the House of Representatives of Thursday, April 9, among other things, announces as follows: "Standing committees of the House of Representatives for the session of 1931—Committee on Forestry, J. M. Sapp, Chairman; G. P. Wood, Vice-Chairman."—*Time*.

Bored

"I'm bored to extinction," cried the knothole."—*Lafayette Lyre*.

Knowing Izaak

"Papa, who was Izaak Walton?"
"What? Do you mean to tell me you don't know who Izaak Walton was? What do I send you to Sunday School for?"—*New Mexico Conservationist*.

Vanishing Americans

White man's stolen the red man's land,
Where Lo once was he ain't,
But the college youth retains his yell
And the flapper has his paint.
—*Boston Transcript*.

Blame It on the Trees

An apple caused the first downfall of man, but peaches have handled the business since that time.—*Chickasha Express*.

Big Game!

"An' what may that be?" asked the Scotchman who was considering moving out to Canada and was being shown a book of Canadian pictures.

"That," explained the immigration promoter, glancing at the engraving of a huge antlered specimen of one of Canada's best-known game animals, "that is a Canadian moose!"

"A moose!" exclaimed the Scotty, closing the book. "Then I'm think'n I'll be bidin' at home! In a country with a moose like that what a turrable monster a rat would be!"—*New Mexico Conservationist*.

Obliging

"I'd like some rat poison."

"Will you take it with you?"

"No, I'll send the rats over after it."—*Professional Engineer*.

Stretching the Plains

They are making rubber from western sagebrush. Now we know what makes the plains stretch so far in every direction.—*New York Evening Journal*.

Not His Kind

"Have you read 'Kennilworth?'"

"Naw. I hate dog stories."—*Southern Lumber Journal*.

Menu

Squaw: "I et with a bunch of Injuns yestiddy."
Squawk: "What'tja have?"

Squaw: "Scalloped potatoes."—*Reserve Red Cat*.



The chap who invited the boys in to see something real from Canada!

Like a Woodpecker

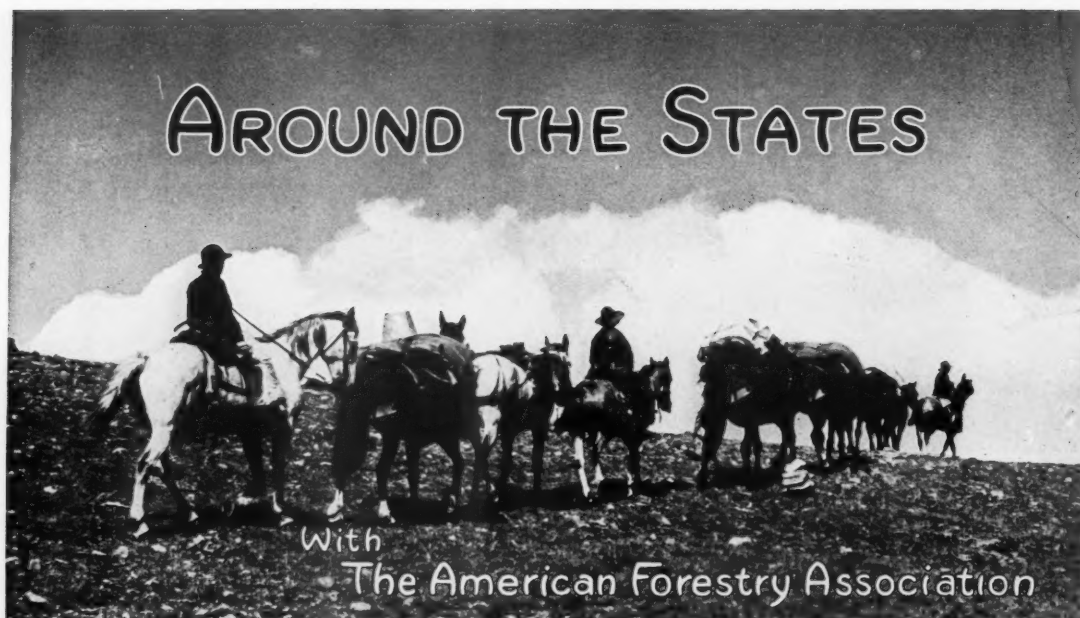
There was an old woman from Leith,
Who used to skin trees with her teeth.
Now it wasn't for pleasure
She adopted this measure,
But to get to the sap underneath.
—*California Pelican*.

Very Queer

A skunk is a very queer animal because it is offensive on the defensive.—*Wisconsin Octopus*.

Notice

Roadside notice posted in New Hampshire:
"By order of the selectmen, cows grazing by the roadside or riding bicycles on the sidewalk is hereby forbidden."—*Cross Section*.



Areas in National Parks Set Aside for Scientific Study

Reservation of areas within the boundaries of National Parks, where conditions will be maintained unmodified, so that geologic and biologic exhibits may continue to be available in primitive form for educational and scientific investigation purposes, has been announced by Horace M. Albright, Director of the National Park Service.

The restricted areas will be located in isolated sections of the parks where use of the park by the general public will not be interfered with, and admission will be granted by special permission.

"It is true that the National Parks themselves are areas preserved in as nearly as possible their natural condition for the use of the people," said Mr. Albright. "The research reserves, however, carry the preservation a step farther, for in them it is proposed to maintain conditions unmodified and free from external influences of any sort in order that their geologic and biologic exhibits may continue to be available in primitive form for the purposes of education and scientific investigation."

The research areas will not be approached by roads or trails, and will be located in isolated sections of the National Parks where they will neither interfere with the administration of the parks or with park use.

The idea of having these special research areas inside the National Parks is not new, as the first one was established in the Yosemite National Park, California, in 1926. Another was established in Mount Rainier National Park, Washington, in 1928.

Appoint Isle Royale Commission

The Isle Royale Park Commission, created by a recent act of the Michigan State Legislature, was appointed on July 1, by Governor

Wilber M. Brucker. Appointments are for four years, and the commission is empowered to acquire title to all lands within Isle Royale and the immediately surrounding islands in Lake Superior for the State of Michigan, and to transfer them to the United States for the Isle Royale National Park as authorized by the Vandenberg-Cramton Act of March 3, 1931.

Chairman of the commission is James MacNaughton, President of the Calumet and Hecla Consolidated Copper Company, of Calumet.

9,121 acres are public land, while corporations and individuals owning the bulk of the island have indicated their intention to transfer to the Commission their rights to over 50,000 acres.

Although the Federal act expressly provides that no public moneys of the United States shall be used for the purchase of lands within the proposed park area, the Commission is authorized to accept gifts of lands or money with which to buy land.

DISTRIBUTE 79,000,000 TREES FOR PLANTING

More than 79,000,000 trees were distributed by states and territories last year for forest planting. Thirty-nine states and Hawaii and Porto Rico reported a total distribution of 79,299,629 trees for reforestation purposes. Of these 25,746,215 were distributed under the Clarke-McNary law cooperative plan to farmers for planting as windbreaks, shelter belts, and farm woodlands. For reforesting of State lands 30,443,654 trees were provided. For planting on private lands other than farms 23,039,760 trees were distributed.

Owing largely to heavy planting on privately owned timberlands, New York led the cooperating states with 24,960,000 trees. Michigan turned out more than 19,000,000, of which 16,000,000 were planted on state lands. Pennsylvania sent out 9,500,000, Massachusetts about 4,000,000, Ohio and Wisconsin about 2,500,000 each.

Governor Roosevelt Endorses State Plans for Land Use

Governor Franklin D. Roosevelt told the Annual Conference of Governors at French Lick, Indiana, on June 2, that large areas in the State of New York and in every other state east of the Mississippi should be growing trees.

In an effort to relieve some of the immediate needs of the state they are undertaking a program of State planning. This State program calls for an intensive development of the good land. With the tremendous competition of good land in this country and in other parts of the world, it has become uneconomical to use land which does not produce good crops.

"We propose," said Governor Roosevelt, "to find out exactly what every part of the State is

capable of producing. From the surveys already made we have come to the belief that a certain percentage of the farmland in the State now under cultivation ought to be abandoned for agricultural purposes. . . . We are faced with a situation of hundreds of farmers attempting to farm under conditions where it is impossible to maintain an American standard of living. They are slowly breaking their hearts, their health and their pocketbooks against a stone wall of possibilities and yet they produce enough farm products to add to the national surplus.

The four other members are former United States Senator William Alden Smith, of Grand Rapids; Harry F. Harper, of Lansing; William H. Wallace, of Saginaw; and Edsel B. Ford, of Detroit.

Isle Royale, located about twenty-five miles north and west of Keweenaw Point in Lake Superior, is approximately forty-four miles long and five miles wide. Of the 123,520 acres within the island, the State of Michigan owns 2,240 acres which the Director of Conservation is directed to transfer to the Commission, and

"What, then," questioned the Governor, "are we to do with the submarginal land . . . which ought to be withdrawn from agriculture? We are finding out what it can best be used for. At the present time it seems clear that the greater part of it should be put into a different type of crop—one which will take many years to harvest, but one which as the years go by will, without question, be profitable and at the same time economically necessary—the growing of trees.

"This we are starting by a new law providing for the purchase and reforestation of these lands in a manner approved by the State, part of the cost being borne by the county and part by the State. Furthermore, a constitutional amendment will be voted on by the people this autumn providing for appropriations of \$20,000,000 over an eleven-year period to make possible the purchase and reforestation of over 1,000,000 acres of land, which is better suited for forestry than for agriculture.

"We visualized also the very definite fact that the use of this submarginal agricultural land for forestry will, in the long run, pay for itself (we will get that \$20,000,000 back many times over) and will from the very start begin to yield dividends in the form of savings from waste.

"By reforestation, this land can be turned into a great state resource which will yield dividends at once. The Conservation Commissioner has just issued an order throwing open for hunting and fishing the 25,000 acres recently purchased under this program and all additional reforestation areas when they are purchased.

"These reforested areas are largely at the higher elevations at the headwaters of streams. Reforestation will regulate stream flow, aid in preventing floods and provide a more even supply of pure water for villages and cities."

Tour of National Parks Is Begun by Secretary of the Interior Wilbur

A trip which may last until autumn and which will include visits to a number of National Parks and reclamation projects was started June 16 by Dr. Ray Lyman Wilbur, Secretary of the Interior, principal speaker at the annual meeting of The American Forestry Association at Asheville.

An inspection of the Boulder Canyon project on the Colorado River with the Congressional Appropriations Committee and the Commissioner of Reclamation, Dr. Elwood Mead, is planned, the Secretary stated orally. The following additional information was furnished.

Ten days will be spent in Colorado at Rocky Mountain and Mesa Verde National Parks and at the Uncompahgre reclamation development, after which the Secretary will go to Salt Lake City. He plans to be at Las Vegas, Nevada, later to go over the Boulder Canyon project, moving on to Los Angeles to hold a hearing on a means of getting to Glacier Point from the valley floor in Yosemite National Park.

A cableway has been advocated for this purpose, but objections have been raised because it might mar scenic beauties.

New York State Extends Tax Relief to Natural Forests

Tax relief on fifteen acres or more of immature, natural forest growth, where such growth will eventually produce a merchantable crop of timber is afforded landowners in New York State through the Hewitt-Hutchinson amendment to the Fisher forest tax law which has been signed by Governor Franklin D. Roosevelt. This is in Chapter 346 of the Laws of 1931. The Fisher tax law as passed in 1929

and amended in 1930 provides for tax relief on artificially planted forests. The new amendment extends this to promising young growth of natural origin. Under the law the assessed valuation of the land cannot be increased but the stumpage value of the timber when cut will be taxed at the rate of six per cent.

Federal Trade Commission Issues Orders on Western Yellow Pine

Under date of June 15, the Federal Trade Commission ordered thirty-nine Pacific coast and western lumber producers to discontinue, in advertising and selling yellow pine lumber of the species *Pinus ponderosa*, the use of the word "white" in connection with the word pine or with other words used in combination with the word "pine." The order was based on the charge that trade terms containing the phrase "white pine" were used in describing western yellow pine although the characteristics of the two kinds of wood are generally quite distinct.

Reviewing the history of the use of the word "white," the Commission reports that ponderosa lumber came to be given terms which include the phrase "white pine" for local markets in California, New Mexico and Arizona about 1880. By 1886 it was being generally marketed under terms including "white pine" in California, Nevada and Utah points with occasional shipments farther east. By about 1900 it was coming into middle western territories and about 1915 ponderosa completed its national distribution by entering New England in a limited way.

In rendering this decision the Commission observed that pine trees have long been divided by wood technologists and the public into two groups, "white pine" and "yellow pine." The white pine includes such commercial species as northern white pine (*Pinus strobus*), sugar pine (*Pinus lambertiana*) and Idaho white pine (*Pinus monticola*). Of the yellow pines, long-leaf yellow pine (*Pinus palustris*), short-leaf pine (*Pinus echinata*) and western yellow pine (*Pinus ponderosa*) are the most important. Of these pines the first two grow in the Southeastern States while western yellow pine is found west of the Great Plains.

Western Land Problems Discussed

A conference of lumbermen, county, state, and federal officials held in Spokane, Washington, on May 25, has resulted in the creation of a committee to investigate forest tax problems in eastern Washington with a view to taking ultimate action for the preservation of forest resources. The committee will include representatives from Washington, Idaho, Montana and Oregon and will be appointed by R. L. Bayne, of the Weyerhaeuser Sales Company.

The prevailing opinion of those who attended the conference was that private interests cannot afford to own forest land unless taxes are nominal during the growing period; that only the best lands can be held permanently by private interests; that much marginal forest land is not suitable for a timber crop but should be protected from fire to preserve watersheds, hold the soil in place, to provide grazing areas and for recreational areas.

The conference expressed the opinion that state and federal governments should permanently own the marginal forest lands and protect them. It was also agreed that the present county policy of selling tax-delinquent timberlands is bad, since such lands are purchased for the value of the second-growth timber, the timber is cut and the land once more is allowed to revert to the county.



He didn't count sheep jumping a fence

NO SIR! The guest we have in mind had his own cure for insomnia! He asked us to furnish a thermos bottle full of hot milk, so that he could have it by his bed, in case he woke up at night, take a drink . . . and then get to sleep again! Thermos bottles and hot milk aren't part of the standard equipment of United Hotels . . . but we do have large, airy high-ceiling rooms, with a feeling of pleasant freedom . . . and the beds . . . well, if you've ever slept in one of our hotels you know how good they are! So there's very rarely occasion for insomnia at any of the 25 United Hotels listed below.

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Montana and Idaho Suffer Forest Fires

Forest fires had burned 5,429 acres in the National Forests of Montana and northern Idaho up to June 10, according to the last fire report released by the regional office of the Forest Service at Missoula, Montana. Last year at this time only 310 acres had been burned. Of the 177 fires, so far this year, 109 were man-caused; the other sixty-eight were set by lightning.

According to the report, there were fifty-seven fires during the first ten days of June. Twenty-three of these were man-caused and thirty-four were set by lightning. Forty-six fires were put out while less than a quarter acre in size, and eight were suppressed while less than ten acres. Three fires reached a size of ten acres or over. These were on the Blackfeet, Pend Oreille and Kaniksu Forests.

Increased Forestry Fund for Alabama

The United States Government has allotted the Alabama Commission of Forestry the sum of \$57,320 for the promotion of timber production within the State during the ensuing year. The funds are to be expended for forest planting and forest-fire protection, according to State Forester Page S. Bunker. The amount allotted is approximately \$4,000 more than for the current year.

Seek Changes in Indian Land Policy

Senatorial hearings in connection with the administration of Indian lands were held on June 15 at Klamath Falls, Oregon. Among those participating in the hearings were Senators L. J. Frazier, of North Dakota; Burton K. Wheeler, of Montana, and Frederick W. Steiwer, of Oregon. Mr. J. H. Scattergood, Assistant Commissioner of Indian Affairs, was also present. The Senatorial Committee considered the possibility of encouraging and educating Indians to take over subordinate positions in various activities including those of forestry departments. The committee learned that owing to the present lumber situation, lumbermen who have purchased Indian timber rights are relinquishing their contracts and forfeiting the original deposits which are occasionally as high as \$8.15 per thousand board feet.

Connecticut Boys and Girls Practice Silviculture to Get Medal

Connecticut boys and girls, working for The American Forestry Association bronze medal will demonstrate their knowledge of forestry with an ax or planting hoe. The work is all of a definitely constructive character and may represent the thinning of a stand of sapling trees to take out the weak and diseased individuals and encourage more rapid growth on the part of the remaining healthy trees; the weeding of a forest plantation so as to cut out the trees which are retarding the growth of the desirable ones; or the planting of at least a half acre to forest trees. In no case shall the demonstration plot be less than a half acre in extent, and each contestant must submit a written report describing the results of the work.

The contest, which closes on November 1, 1931, is open to all Connecticut boys and girls between the ages of ten and eighteen years. Registration blanks for entering the contest may be secured from the Connecticut Forestry Department at Hartford, the Extension Forester of the Connecticut Agricultural College at Storrs, or the Connecticut Forest and Park Association at New Haven.

THOSE AMONG US YOU SHOULD KNOW

The daily story of the forests is closely linked with names—personalities who are pointing the way in the various phases of the outdoors. Forestry, wild life and related fields all have their great and near great, and it is to better acquaint the public with these interesting people—men and women whose names are familiar—that this feature is conducted every month.

More than a quarter century ago, when foresters were popularly supposed to bear the "hardboiled" characteristics of the lumberjack, there appeared in North Carolina a man who immediately became identified as a "forester and a gentleman." He was John Simcox Holmes, a Canadian. A few years later when the forestry work in the State was put on an organized basis, it was the forester and gentleman who

was selected to head it up. He began with a yearly appropriation of \$3,000 and a few employees on a part-time basis. Today, twenty-two years later, State Forester Holmes has one of the outstanding State forestry organizations in the nation, maintaining a personnel of 3,500 and expending yearly a sum in excess of \$150,000. Incidentally, Mr. Holmes, next to State Forester F. W. Besley, of Maryland, has the record of longest continuous service of any State forester in the country. The Maryland forester has served three years longer than his North Carolina colleague.

Under the constant influence of his mother who had a deep, intense love of nature, and following the leadership of Dr. Joseph A. Holmes, professor of botany at the University of North Carolina, and one of the early advocates of Appalachian National Forests, Mr. Holmes became interested in the abundant flora and fauna of forest and field and applied for a position with the United States Bureau of Forestry. As a result, in 1902, he received an appointment as student assistant and was ordered to Texas. His first forestry work was on the lands of the Houston Oil Company, making a valuation survey. Later he was ordered to study hardwoods in the Southern Annalchians.

In 1903 Mr. Holmes entered the Yale School of Forestry with the fear that before he could graduate all the important positions open to technically trained foresters would be filled. Although he had been out of college for fifteen years, he finished the course there near the top of his class.

His appointment as forest assistant was fol-

lowed by four years of miscellaneous duties in the South and Southwest including ten months in 1906 as timber sales inspector in the National Forests of Arizona and New Mexico. Two summers were spent making field studies of forest conditions of eastern and central Kentucky and a winter in Mississippi doing similar work.

In 1909 the position of forester in the North

Carolina Geological and Economic Survey was offered Mr. Holmes, and he accepted. Publicity, education and other public relations work occupied most of his time until in 1915 the forestry law was enacted which provided for a forest fire protective organization, but made no appropriation for its maintenance. Mr. Holmes continued to devote himself to the expansion of the fire protective work until in 1924 when the Survey was moved from Chapel Hill, the seat of the University, to the State capital at Raleigh. The following year the Geological and Economic Survey was transformed and enlarged into the present Department of Conservation and De-

velopment with forestry as one of its major divisions.

The Forestry Division now requires the services of seven technical foresters under the supervision of the State Forester. Besides fire prevention, which uses up most of the appropriation and practically all of the co-operative funds, there are five district foresters and a section of forest planting in charge of an assistant forester.

Born in Ontario, Canada, in 1868, Mr. Holmes accompanied his parents back to England at the age of three, where, in North Wales, he received his early education. At the age of thirteen he settled in western North Carolina with his parents and was brought up on a large farm on the French Broad River. After attending the University of North Carolina for two years he went back to farming.

Mr. Holmes was president of the Southern Forestry Congress, 1924-25, and president of the Association of State Foresters in 1928-29.



J. S. Holmes, Forester and Organizer.

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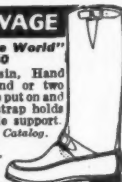
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Book News



and



Reviews

THE BOBWHITE QUAIL, by Herbert L. Stoddard. Published by Charles Scribner's Sons, New York. 559 pages—illustrated in four color plates and halftones. Price \$6.

Unquestionably the most comprehensive book on the bobwhite quail ever to appear, enhanced by a foreword by the distinguished sportsman Colonel Lewis S. Thompson. The thought behind the book is obvious. The bobwhite quail, important ally of the farmer and leading game bird, is threatened, by the development of population and the mechanization of agriculture, with depletion in its numbers, if not extinction. So to know more of the bobwhite quail's habits, life cycle, and importance to the public at large, as well as to the sportsman, the Bureau of the Biological Survey conducted a five-year investigation—in the field, in the laboratory and in the library. The volume comprises the essential information gained through this research.

The detailed findings are presented so that they will be of interest to conservationists and bird lovers in general as well as ornithologists. To the sportsman, game propagators, and others interested in increasing the number of quails, the book is without parallel. Classification and other technicalities have been avoided; inaccessible material, technical and otherwise, however, has been included whenever it is of vital importance to those engaged in the propagation of quail or in its natural field increase.

Among the most interesting chapters are those dealing with the use and abuse of fire on Southern quail preserves; methods of capturing bobwhites; the relation of agricultural activities to the bobwhite; the life history of the bird; and bobwhite's vocabulary.—E. K.

AN ANTHOGRAPHY OF THE EUCALYPTS, by Russell Grimwade. Published by Angus & Robertson, Ltd., Sydney, Australia. 103 pages; illustrated. Price \$9.

An important and valuable as well as beautiful addition to botanical literature in this book by Russell Grimwade. His careful selection of pictures showing the leaf, stem, flower and fruit help in the identification of the eucalypts as the text accomplishes its purpose in awakening a fresh interest in promoting the cultivation of this flora of Australia. To the horticulturist the book will prove invaluable when selecting species for horticultural and other scientific purposes, and to those interested in forestry and botany it will prove of scientific help.—P. V. G.

Natural reproduction in Vermont's three types of climax forests is presented in detail in Bulletin 311, "A Study of Natural Reproduction in Vermont Forests," by George P. Burns and Wallace E. White, which is available from the Agricultural Experiment Station at Burlington, Vermont. The three types of climax forests considered are red spruce, white pine and mixed hardwoods which the authors describe as "vegetational climaxess resulting from a long series of plant successions which have approached more or less static conditions."

KOSTYCHEV'S CHEMICAL PLANT PHYSIOLOGY, translated and edited by Charles J. Lyon.

Published by P. Blakiston's Son & Co., Inc., Philadelphia. 497 pages; illustrated. Price \$6.

This is a translation from the German of the work of Dr. S. Kostychev of Leningrad on chemical plant physiology as distinguished from plant physiology. It deals with the assimilation of various nutrient substances and with the handling of them within the plant body.

The translator, Dr. Charles J. Lyon, of Dartmouth College, outlines the book as follows: "First there is an exposition of the assimilation of the elements required by plants. Then follows the description of the transformation of the assimilated foods in connection with the various vital requirements of plants. Finally, there is a discussion of the biochemical processes which furnish energy to plants. As it has already been indicated, all these processes are treated as chemical reactions."

In the chapter on "The Assimilation of Solar Energy by Green Plants," the author says that this "consists in the absorption and assimilation of atmospheric carbon dioxide by the green parts of plants whereby the carbon remains in the plant and the oxygen is returned to the atmosphere. Thus the CO₂ is decomposed into C and O₂. This process involves the use of considerable energy which in nature is furnished by the radiant energy of the sun."

The book is designed essentially for text and reference purposes and assumes a knowledge of plant physiology as well as organic chemistry on the part of the reader.—G. H. C.

Details concerning the Dutch Elm Disease are presented in Circular No. 170 of the United States Department of Agriculture at Washington, D. C. Written by Curtis May, of the Department of Botany, Ohio Agricultural Experiment Station, and G. F. Gravatt, of the United States Department of Agriculture, it tells a brief history of the three infected trees found in Cleveland in 1930, and summarizes information secured by European scientists.

All the laws affecting the forests and shade trees of Delaware, and those creating the Delaware State Forestry Department are included in "Delaware Forest Laws," Publication 4 of the State Forestry Department at Dover.

PUBLIC LAND STATUTES OF THE UNITED STATES. Table of contents and index. 855 pages. Price \$1.50. Bound in buckram, Superintendent of Documents, Washington, D. C.

A compilation of the existing public land laws of the United States down to the close of the second session of the 71st Congress, compiled under direction of the Secretary of the Interior. The book is a valuable working tool for those engaged in administering public lands, for the legal profession, for those interested in National Forest acquisition and for National Park administrators. The Weeks Act of March 1, 1911, creating the National Forest Reservation Commission, is included, as are also the subsequent amendments and the act of June 7,

1924, authorizing annual appropriations for land purchases.

FIELD BOOK OF PONDS AND STREAMS, by Ann Haven Morgan. Published by G. P. Putnam's Sons; 448 pages; illustrated. Price \$3.50.

Who is there who has walked through woods and over swamps but has wished he knew a little more about the life about him? One may know some of the trees and shrubs, but the insects are only annoyances, and the smaller plants are a mystery unless they bear some familiar flower. Dr. Morgan has recognized that the world is filled with people whose knowledge is scattering and whose curiosity is so unending that they forget to plod through dull textbooks after they return home, and so they learn nothing of what they have seen. To help them, she has prepared a pocket-sized reference book, well illustrated and carefully indexed, where one can find a little about many forms of life that abound in our ponds and streams.—G. H. C.

Quail Breeding in America and The Pheasant Breeding Manual, published by the Foundation, "More Game Birds in America, Inc.," 580 Fifth Avenue, New York City. Available to interested people free of charge by application to that organization, these booklets are the first and second of a series they will issue on the propagation of various species of game birds. Practical and simple in treatment, the most modern methods of breeding quail in confinement, and breeding and rearing pheasants, are fully described and illustrated, and the text has been approved by leading authorities on quail and pheasants in the United States.

BIG TREES OF THE GIANT FOREST, by George W. Stewart. Published by A. M. Robertson, San Francisco, California. 103 pages; illustrated. Price, \$1.50.

Known as "the oldest of all living things," the Big Trees in the Sequoia National Park in the Sierra Nevada of California are the only known survivors of a family once well represented on this planet. Few of us know the story or growth of this tree and it is to this end that Mr. Stewart has written this little book telling the life story of the Big Trees.

In handling such a noble and historic subject briefly it would seem a bit difficult to give sufficient reverence to things of such majestic age, or to cover fully their meaning, but Mr. Stewart does both in his delightful little book.—P. V. G.

"The Deer Problem in the Forests of Pennsylvania" is presented in a new publication by Research Forester H. E. Clepper and distributed free by the State Department of Forests and Waters, at Harrisburg.

Describing the original forests of Pennsylvania as abounding in game animals such as deer, elk, bear, bison and moose, the author points out that although animal food was then plentiful the overproduction of game was prevented by predatory enemies such as the wolf, wildcat, panther and Canada lynx.

Extensive clearing and settlement drove game into the remaining wilderness and reduced the number of deer until they were headed toward extinction by 1850. Elk and bison had disappeared, and rapid reduction of the deer herd occurred during the quarter century following the Civil War. Only forty years ago deer had become so scarce in Pennsylvania that it was rare to see one in its native haunts.

With the big days of lumbering past and the creation of game and forestry offices, just before 1900, deer began to increase.

The problem today is not lack of deer but too many. Overpopulation of deer in many sections has led to a shortage of forest food, which results in their undernourishment and suscep-

tibility to disease or actual starvation. Based upon European experience American foresters estimate that twenty to forty deer can exist comfortably on one thousand acres of Pennsylvania forest. Excessive injury to tree plantations and crops is common, and in many places reforestation is out of the question due to deer damage.

LET'S GO FISHING, by Charles Reittel. Published by McGraw-Hill Book Company, Inc., New York. 195 pages; illustrated. Price \$2.50.

With a foreword by Gifford Pinchot, this book is built up on information for the angler. It tells specifically how and where to catch fish, whether they be sunnies, black bass, eels, wall-eyed pike or any of the host of others of common fresh water fish. The author, former Fish Commissioner of Pennsylvania, while dealing somewhat with the lives and habits of fish, relates many extraordinary experiences with rod and reel. Throughout he holds the feel and flavor of the sport, as well as the outdoors. It is a welcome addition to any fisherman's library, whether he be novice or expert.—E. K.

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On the capitol grounds at Raleigh, North Carolina, Governor O. Max Gardner places the first shovel of earth around the Mount Vernon walnut tree descendant held by F. H. Claridge, assistant state forester.

STATES PLANT HISTORIC WALNUTS

SCOUTS, state governors, a ten-year-old youngster, and foresters are among those who are taking an active part in the international nut tree planting campaign of which The American Forestry Association is one of the sponsors. Moreover, many tiny but sturdy descendants of trees on historic grounds have made their debut from the soil, although the seeds were gathered only last fall. Sites which now bear trees with traditions include state capitol grounds, highways, school yards and farms. Gov. O. Max Gardner, of North Carolina, and Acting Governor Herbert H. Lehman, of New York, led Boy Scouts in programs dedicated to the celebration of the birthday of George Washington which were held on the State Capitol grounds at Raleigh and Albany.

The young trees, like those planted at the statehouses in Dover, Delaware, Carson City, Nevada, and Salem, Oregon, were descendants of the walnut trees at Mount Vernon, the home of the first President. Others of these famous trees, which are the most sought after of all those distributed by the National Nut Tree Planting Project, have been sent to Juneau, Alaska, Phoenix, Arizona, Boise, Idaho, Indianapolis, Indiana, Des Moines, Iowa, Santa

Fe, New Mexico, Bismarck, North Dakota, Pierre, South Dakota, Olympia, Washington, and Cheyenne, Wyoming.

It is expected that during 1932 Mount Vernon walnut tree descendants will have been planted or dedicated at every state capitol, in forty-two foreign countries where this Government owns official property, and on the grounds of the United States Capitol and the Washington Monument.

Due to the ever-increasing field of cooperation, walnuts from Arlington, Mount Vernon, and Camp Roosevelt have been planted on the borders of State Highway 120 in Pennsylvania and Highway 80 in Mississippi. The seeds from Arlington—the estate that was the home of Robert E. Lee for thirty years and which is now a national cemetery and the resting place of the nation's heroes and statesmen—were set out on a highway near Forest, Mississippi. Mrs. J. A. Neill, clubwoman, took charge of a program in this community for the boys who are just beginning their Scouthood. District Forester Charles Baer supervised Pennsylvania Scouts in planting seeds from historic grounds along a major highway, and will see that they have proper care.



In Connecticut—Eagle Scout Clarence Rosenbeck and First Class Scout Edwin Ryan, with their Scoutmaster, planting the historic walnut seeds in the People's Forest Nursery at Barkhamsted.

F. B. Trenk, Extension Forester of Wisconsin, has demonstrated his enthusiasm for the nut tree planting campaign by incorporating it as one of the state's extension projects. Through the news service of the University of Wisconsin he sends out bulletins telling of the opportunity of exchanging nuts from historical places in Wisconsin for those from famous estates in the East. In addition he is enlisting the aid of county historical societies in locating places of interest, and in supervising the collection and shipping of nuts. Nursery space has been set aside for the propagation of seedlings.

The state foresters of North Carolina, Ohio and West Virginia have provided nursery space for seeds from Gettysburg, Arlington and Guilford Court House and from the home of Admiral Byrd and the grave of Nancy Hanks Lincoln. Later they will distribute the seedlings to Scouts for memorial plantings.

Scout Executives and Scoutmasters in many states have adopted this conservation program as projects for their troops and have procured nursery beds for the propagation of seeds. By this means they are teaching Scouts tree culture and are giving sugar-coated lessons in American history at the same time. Hikes have been scheduled for the fall when Scouts will locate trees on historic grounds in order to facilitate collections during nutting season.

The Chamber of Commerce of South Dakota, under the leadership of Frank D. Kriebs, former state secretary of agriculture, has undertaken to stimulate the planting of nut trees in that state. Mrs. S. Y. Sipling, of Santa Monica, California, is growing Mount Vernon seedlings in her garden for distribution to chapters of War Mothers for memorial planting. Scouts in the Cook School Patrol in Chicago were led in a planting program by Mrs. C. B. Smith.

Two Scouts living in geographical extremes on the eastern coast report that the walnuts they planted are "doing fine." Up at Nashua, New Hampshire, William Hill has a six-inch descendant of a tree at Arlington; and as the result of painstaking care, Lawrence Enloe of Felda, Florida, has succeeded in growing a young walnut tree from a seed from Admiral Byrd's Virginia home.

An Alabama boy has named two cherished seedlings which stand twelve and fifteen inches "Propellor" and "Independence" because their sources were the homes of Admiral Byrd and Thomas Heyward, Jr.—the former forever associated with airplanes and the latter with the Declaration of Independence.

One little girl in North Carolina planted three walnuts with one hundred per cent success. She has three twelve-inch trees which are "growing fine." Filled with the cooperative spirit of the tree planting program she writes, "Some time when they bear fruit I'll send some for presents or will it be paying an old debt?"

In Connecticut, under the leadership of Scoutmaster Chiswell and with the cooperation of District Forester S. E. Parker, who provided nursery space, Boy Scouts of Torrington planted walnuts from the old town associated with Maryland's early history, Tridelpia. A picture shows Eagle Scout Clarence Rosenbeck and First Class Scout Edwin Ryan and their Scoutmaster hard at work actually getting the seeds in the ground at the People's Forest Nursery at Barkhamsted.

Migratory-Bird Refuges in Indiana

The United States Government is authorized under Senate Bill No. 29, recently passed by the legislature of the State of Indiana, to acquire by purchase, gift, or lease, areas of land or waters within the State of Indiana for the establishment of migratory-bird reserves in accordance with the Norbeck-Andresen Act, which was approved by Congress on February 19, 1929.

The Plant Patent Law

Application for plant patents under the Townsend-Purnell Act, passed during the Seventy-first Congress, as well as any information relating to plant patents should be addressed to the Commissioner of Patents, U. S. Patent Office, Washington, D. C. The Department of Agriculture will assist in the consideration of plant patents, but only upon the request of the Commissioner of Patents. Department of Agriculture employees have been instructed by the Secretary to refrain from expressing any opinion as to the novelty of an alleged invention in advance of the filing of an application for patent, and neither can they expound or act as counsellors for individuals regarding the plant patent law.

Idaho Boys and Girls Plant Trees

The Pocatello Forestry Club, consisting of Idaho 4-H boys and girls has planted 1,500 pine trees in a canyon about thirteen miles from Pocatello on land which they have acquired on a ten-year contract from the city. The trees were raised in the club nursery situated across from the Pocatello High School on land donated to the boys and girls.

Another group of girls in Moscow have formed a forestry club which last spring planted Douglas fir trees as memorials to George and Martha Washington.

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Being Just-So Tale Number Four

As a child, my thoughts of Massachusetts' old Deerfield were strongly linked with the brook which ran red with the blood of the citizens killed by the Indians.

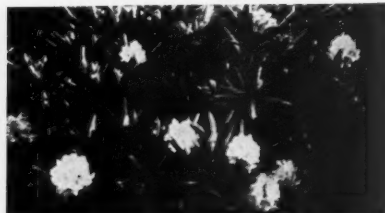
But how secondary all that now is, when you drive down that wonderful cathedral aisle of towering old elms. What peace they seem to instill. How like a perpetual benediction. Which

thought always starts me wondering why more elms are not planted. We sort of believe an elm revival is due, now that the way to plant them in both low ground and high has been found out. In any event, we have a fine stock of them growing in our 300 acres. It's something you might like to remember.

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The Colorado School of Forestry

A Department of Colorado College

will be permanently discontinued effective in June, 1934. No entering freshmen students in this course will be accepted in the fall of 1931 or thereafter.

Gordon Parker, Director
Colorado Springs, Colorado

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Time is not usually considered a commodity to be bought and sold, but in planting our large sized forest trees, you can buy the 4 to 8 years it has taken these to grow from 3 year transplants.

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Florida Medal Winners Visit Washington

Miss Irene Haas of Tampa, and John Bills, 3rd, of Sanford, whose essays entitled "Forest Fires—Florida's Tragedy" won the recent contest sponsored by the Florida Federation of Women's Clubs and the Florida Forest Service, were the guests of The American Forestry Association and the Florida Forest Service in Washington on June 17, 18 and 19. They were accompanied by Mrs. Walter L. Wylie, of St. Petersburg, whose activities as chairman of the Conservation Committee of the Florida Federation of Women's Clubs were largely responsible for the success of the contest, and by Mrs. John Bills, Jr., mother of the prize-winning boy.

Winning the contest included The American Forestry Association bronze medal for each, their expenses from Florida to Washington and entertainment for three days at the Wardman Park Hotel.

During the first day they were received by Senator Duncan U. Fletcher, the senior Senator from Florida, who expressed his interest in forests and recalled his active participation on the Senate Select Committee on Reforestation which resulted in drafting and passing the Clarke-McNary Act in 1924. Although Representative Ruth Bryan Owen was absent, they called at her office and through her secretary, Mrs. Jessie R. Hill, received letters which helped them to see many of the public buildings.

On the evening of the second day the Florida party visited the National 4-H Club camp on the grounds of the Department of Agriculture. There they met with Extension Forester W. K. Williams, of Washington, D. C.; Porto Rico's Extension Forester, Charles Z. Bates, and the six 4-H Club delegates who have included forestry in their programs during the past several years. These were: David Campbell and John B. Folsom, of New Hampshire, who combined forest planting and woodland care with the growing of potatoes and other farm crops; Alice Lee, of New Jersey, whose activities in millinery, food preparation and room improvement were varied with a study of trees; Ralph Suggs, of North Carolina, who has been planting black locust seedlings to stop erosion on

his home farm, and also raises chickens, corn and calves; Arlow B. Wilson, of Ohio, who established a plantation of pine during spare times between the preparation of potato and poultry demonstrations; and John A. Tasker, of Vermont, who has been a member of the Forest Preserver Club since 1926. Like David Campbell, of New Hampshire, he has been chosen to demonstrate his knowledge of forestry at Camp Vail in Springfield, Massachusetts. These boys and girls were among the 156 outstanding members of the 4-H Clubs of forty-one states and territories and sixty-seven state leaders who were brought together by the Department of Agriculture for the Fifth National 4-H Club Camp in Washington.

During their stay in Washington, Irene Haas and John Bills, 3rd, visited the National Capitol, the White House, the Lincoln Memorial, the Washington Monument, Mount Vernon, Arlington and a number of other places of national interest in and around the District of Columbia.

In addition to the two first-prize winners, second prizes of \$50 each were given to Jeanne Sheebler, of Miami, and Dick Ezell, of Bonifay, Florida, and third prizes of \$25 to Miss Margaret Bryan of Gainesville and Cecil Boykin, of Sneads, Florida.

Big Game Pass Million Mark in Forests

Big-game animals in the National Forests now number more than a million head. A gain of approximately nine per cent in twelve months is shown by the annual wild-game "census" of the United States Department of Agriculture, just announced.

The total big-game population of 1,073,111 is an approximation of the number in the 151 National Forests as of the first of this year, the figures being based partly on actual count, partly on estimates by experienced local forest officers, says the Department, adding that game animals on public and privately owned range outside the National Forests were not included in the estimates. The National Forests, however, include the greatest total area of big-game range now remaining in Government ownership.

This year's increase is chiefly in deer, but elk also have gained considerably. Moose, mountain sheep, mountain goats and antelope, none of which is very numerous, show slight gains. Bears are keeping up the struggle for existence in fair numbers, although the great grizzly gave ground in many of the National Forests and black and brown bears suffered in some localities.

McCarthy Receives New York College Appointment

Edward F. McCarthy has been appointed head of the Department of Silviculture of the New York State College of Forestry at Syracuse, New York. He was formerly a member of the college faculty and succeeds the late John W. Stephen.

Professor McCarthy was graduated from Michigan University Forest School with the degrees of B.S. in 1911 and M.S. in 1916. He was one of the pioneers in the organization of the New York State College of Forestry in 1911-12, and an early director of the Ranger School at Wanakena, New York, and later was acting head of the Department of Utilization at the college.

Professor McCarthy resigned in 1920. He was connected with the Appalachian Experiment Station at Asheville, North Carolina, and became director of the Central States Forest Experiment Station at Ohio University, Columbus, Ohio, at the time of its organization in 1927, where he has served ever since.



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FRANCIS G. MILLER, Dean

Ask the Forester?

Each Month Forestry Questions Submitted to the Association Will Be Answered in This Column. If an Immediate Reply is Desired a Self-Addressed, Stamped Envelope Should Accompany Letter.

QUESTION: Do you believe it would be advisable to use peeled native popple (quaking aspen) logs which have been thoroughly painted or stained for building a log cabin, providing the bottom or sill logs rest on stone or concrete and are not in contact with the ground at any point.—G. O. H., New Jersey.

ANSWER: I can see no reason why you should not use peeled native popple, or quaking aspen, if the logs are thoroughly dry and well up from the ground. A good grade of creosote brushed on makes a satisfactory covering. For a time its odor is slightly objectionable to some who might live in the cabin, but it has the advantage of discouraging many insects.

QUESTION: I wish to screen quickly a forty-foot-high house which is behind mine. Small pines are too slow. I had concluded to use poplars but all tree lovers I have met in the Eastern States are bitterly opposed to them and get quite eloquent over their inferiority to every other kind of tree. Their chief objection to the poplar is that they die in twenty-five years.—J. W. S., New York.

ANSWER: If you want to get a tall screen, quickly and at a low cost, there is scarcely anything to equal Lombardy poplar. Possibly it would be accomplished by Chinese elm. Poplars will furnish an effective screen for undesirable backgrounds in five or six years. After all, if they will accomplish this for twenty-five years they may fully serve their purpose.

QUESTION: Have you had any experience with the use of a receptacle for records to be sealed and buried among the roots of a memorial tree?—M. H. McD., Massachusetts.

ANSWER: Chief Forester H. O. Cook, of Massachusetts, writes he has twice been present when records consisting of a roster of the organization doing the planting and a program of the occasion were buried beneath the tree. In one case they were enclosed in a specially made copper tube, and in the other in an ordinary glass preserve jar. But such records are difficult to regain and are quickly forgotten. As a rule it is more satisfactory to establish a permanent tablet at the base of the tree.

QUESTION: Is bone meal a good tree food? Can it be applied by placing it in holes under the tree?—G. H. K. S., Virginia.

ANSWER: Bone meal is considered a very good tree food. Although primarily rich in nitrogen, it is not a complete tree food. One satisfactory tree food mixture is made up of

about six per cent nitrogen, eight per cent phosphoric acid and three per cent potash with the rest of the material as filler. Nitrogen may be derived from three sources, ammonium sulphate, cottonseed meal and bone meal. Some authorities believe this is more satisfactory than to have the nitrogen all from one source. Phosphoric acid may be derived from acid phosphate and bone meal while potash may come from muriate of potash. Such a tree food may be applied by boring holes ten inches to eighteen inches deep at a distance of eighteen inches to two and a half feet from the base of the tree. Trees two to three inches in diameter have been successfully treated with as many as twelve holes into each of which two and a half to four ounces of fertilizer were poured. Larger trees would take more fertilizer and holes would be bored as far out as the branches extend. Most of the material in this fertilizer is relatively slow to become available so that one application should be good for a whole year.

QUESTION: Can you tell me where I can find information in reference to sycamore trees? I lived in the mountains of Kentucky for more than twenty years and was told by the oldest inhabitants that a sycamore never died. I am amazed that they are not used more for parks.—H. B. L., New York City.

ANSWER: There is no more reason to believe that a sycamore never dies than there is to believe that such is true of any other trees. Trees are living organisms and so long as they live they grow, but like all life they are susceptible to circumstances that bring about death. The sycamore is a fairly long lived tree, which occasionally reaches a height of 140 feet and even 170 feet, with the trunk ten to eleven feet in diameter. Although not a rapid grower, sycamores might obtain such a size in one hundred to three hundred years.

Frequently sycamores become infected with wood-rotting diseases which cause the entire heart to drop away. The cambium continues to grow new wood and bark, with the result that great hollow trees are occasionally seen. Dr. Charles S. Sargent in his authoritative book, "Manual of the Trees of North America," states that the sycamore is the most massive if not the tallest deciduous-leaved tree of North America.

American sycamore and its near European relative, the London plane tree, are frequently planted in parks and on highways. The leaves are particularly resistant to acid-forming smoke and fumes and for that reason these trees are especially adapted for city park purposes. Sycamores are frequently used on the streets of Washington, D. C., and an unusual avenue of them extends from the Peace Monument to the west entrance of the National Capitol.

Forest-Fire Prevention Movement Gaining in Arkansas

National Forests in Arkansas have been relatively free from fire this year, only 173 fires being recorded so far as against 408 by May 31 last year, says the United States Department of Agriculture. The area of National Forest land burned is 1,572 acres, while the loss a year ago was 12,103 acres.

Improved weather conditions and better cooperation on the part of local residents to prevent fires have prevailed in both the Ouachita and the Ozark National Forest areas, according to the Department.

"The building of forest development roads and trails in the National Forests is responsible for some of the growth of cooperation and good-will in Arkansas," State Forester Stabler reports. "The building program has given employment to many local people and has fostered a pride in the value and beauty of the Arkansas forests."

Arkansas Boy and Girl Win American Forestry Medal

Under the title "The Value of Forest Fire Prevention to My County" more than one thousand essays were submitted by school children of Arkansas in a contest for The American Forestry Association medal sponsored by the Extension Service of the Arkansas College of Agriculture. Sixteen-year-old Marie Treece, of Marshall, in Searcy County, wrote the essay which for originality and ability won first place among the girls, and permits her high school to hold the bronze plaque mounted on black walnut for the coming year.

R. K. Barner, an eighteen-year-old farm boy from near Fordyce, in Dallas County, won first place among the boys. He and Marie Treece have each been given the American Forestry Association medal with their name and the date engraved upon the reverse side.

Defends Use of Wood Ties

"Any large reduction in the consumption will hinder the development of continuous forest management by reducing another market from which must come the revenue to meet the costs of management," declared Dr. Wilson Compton of the National Lumber Manufacturers Association in a letter to Representative Leonidas C. Dyer of St. Louis, Missouri, in answer to the Congressman's published proposal to sponsor legislation requiring railroads to replace wooden ties with a substitute such as concrete or steel.

Dr. Compton's letter pointed out that there is no shortage of material for wood ties, that they last longer than substitutes, are more economical and better, and their production is an important item in maintaining prosperous rural life in the producing regions where thousands of farmers get profitable labor during winter months.

During 1929 the railways of the United States used 79,000,000 ties as compared with 105,000,000 ties in 1909. Replacements now average about 100 ties to the mile, each year, and treated ties now being used have a life of thirty to thirty-five years. On the basis of an average cost of \$1.75 for each treated tie laid in the track, the cost per year is less than six cents. This, according to the National Lumber Manufacturers Association brings the cost below that of any comparable substitute. Furthermore it was pointed out that if trees are not used they go to waste, and whether used or allowed to rot in the forests, nature replaces them.

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**RICHARD T. FISHER
Director**

Recommends Reduction of Kaibab Deer Herd

Too many deer are attempting to eke out an existence on the Kaibab plateau on Northern Arizona and that there exists "a most urgent need for reducing the present number" is one of the findings of the Kaibab Investigating Committee which completed a field examination of the Kaibab area last month. In its investigation the committee traveled over six hundred miles within the Kaibab National Forest and the Grand Canyon National Park. So acute is the food supply of the Kaibab deer that the committee recommends a reduction in the present number to a point much below the present limited carrying capacity of the range. The deer herd once reduced, the committee believes, should be maintained at a reduced level until the various species of shrubs and young trees upon which the deer depend for browse are re-established. The deer may then be permitted to increase to such numbers as the natural food supply may sustain. This can be brought about by careful game management, the committee believes. During the period of range reestablishment it recommends that all forms of natural wild life other than deer in the Kaibab area be left undisturbed and that suspension of federal and state predatory animal killing be continued.

Under present overgrazing conditions, the committee holds that the Kaibab area is not now producing more than ten per cent of the nutritious forage it once produced. This depleted condition of the range, it is pointed out, is due to heavy cattle grazing in years past and to heavy grazing by deer in recent years. The forage of the entire Kaibab area is yet in a deplorable condition, the committee states. "The committee considers the total lack of aspen reproduction, the continuous browsing of conifer species, and the deterioration of the best remaining browse species an indication that the deer are still so numerous as to make range recovery impossible. We, therefore, recommend that supervised hunting be continued and a removal not less than that of last season, including both sexes, be effected this fall by licensed hunters or by other legal methods."

The present grazing of cattle and sheep in the Kaibab area, the committee reports, is now insignificant, although there is some unauthorized cattle grazing. It is desirable, the committee believes, as a measure of range restoration, to eliminate unauthorized cattle as well as to reduce the deer to a point where choice browse species will be able to recover. The number of deer on the Kaibab plateau, according to the committee, is so great that overgrazing is threatening certain forest types. The reproduction aspen, for example, is nowhere to be seen. Practically all pine, spruce and fir reproduction has developed a peculiar Kaibab form, due to repeated browsing of terminal buds by the deer.

It is pointed out as a curious fact that there are some regions on the Kaibab where forage for deer still persists to considerable extent that is little utilized by these animals. This is especially noticeable on the northern part of the plateau through which visitors usually come enroute to the Grand Canyon National Park. It is not uncommon, therefore, for visitors to get the erroneous idea that there is still much forage for deer. "One must go back into the forest and down onto the winter range areas," the committee says, "to get a real appreciation of the general lack of forage. Absence of sufficient water is one of the reasons why the deer do not use the north end of the plateau in summer."

Range depletion, the committee declares, is as serious within the National Park as within

the adjoining Kaibab area. The two national areas, it is held, are an intimately connected biological unit, and the Park Service should be as much concerned with the perpetuation of the park flora as with the perpetuation of the park fauna. Calling attention to the fact that all animal life is directly or indirectly dependent upon plant life, the committee declares that grazing within the park must be corrected if the plant life is to be restored to anything like natural conditions. The great importance of the preservation of the wild life as an educational and pleasure-giving attraction to visitors to the park is stressed, and the committee points out that animal depletion is sure to follow closely plant depletion.

In its report the committee expresses the belief that the Kaibab study and demonstrations should mark the beginning of a new era in big-game management in the western United States. "A study of the Kaibab situation has emphasized the close relationship of game management and forest management," it declares. "Game cannot exist without subsistence and cover. Range destruction means game destruction. Apparently excess grazing by deer is more destructive to forest reproduction than utilization of the same intensity by either sheep or cattle. Both must be avoided if our forests and ranges are to be saved. Game preservationists, to be consistent, must oppose overgrazing by game as strenuously as they have opposed overgrazing by sheep and cattle. Overgrazing by game is certain to defeat the objects of both forest and game conservation."

The rapid increase of big game in many National Forests, the report continues, has introduced a new and perplexing factor in National Forest management, but the committee sees nothing alarming in this increase of big game if sane methods of management and control are developed and applied before serious range and forest injury results. The handling of the Kaibab situation by the Arizona Game Commission and the United States Forest Service, the committee believes, "offers a splendid example of the efficiency of closely supervised hunting to remove both male and female deer from overstocked areas."

Another recommendation of the committee is for more coordination and cooperation among federal departments concerned with biological and economic problems as affecting the management of federal lands and the plant and animal life produced thereon. The committee urges the extension of the research activities of the United States Biological Survey in order that this scientific bureau may lend greater assistance to the Forest Service, the Park Service, and other government agencies concerned with biological problems.

The committee's report stresses the need of additional man power for the proper field administration of the Kaibab Forest. "It appears impossible," the committee states, "for a supervisor with only one ranger to maintain adequate administrative control over seven hundred acres of forest and range lands."

There have been radical limitations in permits for the use of the Kaibab range by local residents in the grazing of cattle and sheep. These limitations the committee recognizes as necessary for the perpetuation of the deer herd and it holds that no increase in the grazing of local livestock should be permitted while the range is in a depleted condition.

The Kaibab Investigating Committee was created at the instigation of the Forest Service in order to review the handling of the deer problem by the Service and to offer suggestions and advice looking to improved methods and

plans of handling. The personnel of the committee included: Dr. T. Gilbert Pearson, Chairman, representing the National Association of Audubon Societies; Mr. George D. Pratt, representing The American Forestry Association, the American Game Association, and the Camp Fire Club of America; Mr. Mark Anderson, representing the Izaak Walton League; Mr. Joseph S. Dixon, representing the National Park Service; Dr. E. R. Hall, representing the American Society of Mammalogists and the Museum of Vertebrate Zoology; Mr. K. C. Kartchner representing the Arizona Game and Fish Commission; Mr. J. M. Macfarlane, representing the American National Livestock Association; Mr. A. A. Nichol, representing the University of Arizona, and Mr. Paul G. Redington, representing the United States Biological Survey.

THE LUMBER INDUSTRY STANDS AT BAY

(Continued from page 461)

(2) an emergency moratorium on annual timber-cutting requirements, on application of any lumber manufacturer now having a contract for Government timber; (3) a periodic survey, report and publication of lumber production, condition of inventories and suggested production quotas for each region or species, as an aid to the industry in national planning of production and distribution; (4) sanction of reasonable trade agreements for putting lumber production under control, subject to supervision by some Federal agency; (5) a frank, public declaration that there is no reason to believe that there will be a timber famine or a timber shortage, that the continuation of such predictions will cause a decline in commercial wood uses and thereby destroy the economic incentives to forest conservation; and that the serious public problem is not of lumber supply but of maintaining the sources of profitable industry and employment, the productive use of land, and the protective values of forest growth; (6) elimination of unfair foreign competition; (7) readjustment of building costs in order to encourage and justify public confidence in the soundness and security of building values; (8) effort to encourage and facilitate the economical financing of home building and ownership and of farm building.

The remaining corrective measures I suggest are classified as permanent remedies of the causes, as distinguished from the symptoms of overproduction, and are as follows:

(9) A yield tax on timber instead of the present annual property tax, to be adopted by the principal timber states.

(10) A system of land exchanges under present law or amendments, whereby private owners may donate timberland to the Government, reserving timber-cutting rights under reasonable restrictions. Collaboration with the principal timber states would be necessary. Such a system would relieve the pressure of premature liquidation of timber holdings.

(11) Mergers in the interest of economy, stabilization and diversification of production and distribution of forest products, of sustained yield operation, and of permanent productive uses of forest lands. Large unit operations should be encouraged.

(12) A deliberate Federal timber and sales policy which would give maximum encouragement to sustained yield management of privately owned timberlands, while holding in reserve the Government-owned timber as originally contemplated in the establishment of the National Forest Reserves.

(13) A "pure lumber law," comparable to the pure food law. It would require that lumber shipped in interstate commerce be graded and identified in accordance with a publicly recognized system of grading standards, such

as the present American Lumber Standards. It would promote fair and equal competition of producers, distributors and consumers of lumber. The voluntary action of the industry in this direction has not attained the objectives because of lack of general support.

(14) Anti-trust law policy change—added impetus to such deliberate constructive changes in the system of antitrust laws and their administration as will provide adequate public protections without the burdens of waste, insecurity and instability attributed to present laws and their administration.

(15) The United States Government, as the largest timber owner and proportionately, therefore, the largest permanent beneficiary, should take the lead in wood research. This is the only permanent and constructive means of solving the practical problems of timber conservation and continued productive use of forest land.

(16) There should be established and maintained through some board or commission of the Federal Government the continuing means of public and private cooperation for timber conservation, for aiding the effort at stabilization of the forest industries, promoting steady employment therein, seeking improvements in wood utilization, encouraging the productive use of forest land, and for these purposes facilitating cooperation among the states, the owners of timber properties and the Government.

The American people—through the ownership of vast National and State forests—are in the timber business on a large scale. As consumers they are interested in the permanence of the supply of forest products; as citizens, in the perpetuation through the lumber and wood-using industries, of the profitable sources of livelihood of millions of their fellow-citizens. Public understanding and public cooperation will greatly aid—and the absence of it will greatly hinder—the economic rehabilitation of the timber industries, without which forest conservation will be merely the form without the substance. The prospect,—without it,—is of gradual disintegration as a national industry; with it,—of the ultimate establishment of wood, in its physical forms and its chemical derivatives, as the most universally useful of the materials of industry, and of forest lands as a continuous source of national wealth and welfare.

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Former Guide to Become Alaska Game Commissioner

Andrew A. Simons, of Lakeview, Alaska, has been appointed Alaska Game Commissioner from the third judicial division to succeed Dr. William H. Chase, whose four-year term expires June 30. The United States Department of Agriculture announced. Mr. Simons is a naturalized citizen of Alaska, and for several years has been a registered guide in the Territory. He has been well known for his success as a guide, for his wide acquaintance with prospectors and trappers in the Territory, and for his knowledge of wild-life conditions in Alaska, particularly in the third judicial division.

Pennsylvania Votes State Tree and Bird

Legislation officially adopting the hemlock as the state tree of Pennsylvania, introduced by Honorable Alex R. Wheeler of Forest County, and unanimously approved by both Houses of the Assembly, was signed by Governor Pinchot on June 22. The hemlock has helped give the Keystone State leadership in the lumber world. In 1873 there were seven billion board feet of hemlock, nearly double that of white pine and as much as all other timber trees combined. In 1899 the cut of hemlock formed two-thirds of the entire lumber production. According to Secretary Lewis E. Staley, of the Department of Forests and Waters, hemlock still leads.

Hemlock grows naturally in every county of the state, especially in the mountainous regions. It is widely planted for the beautification of home grounds, parks and public places. In the open it forms a handsome conical crown of dense foliage with branches down to the ground. Its terminal sprays, drooping gracefully and in early summer sprinkled with tender yellow leaves, form a harmonious and contrasting setting against the darker foliage of former years.

During the same session of the General Assembly the ruffed grouse was made the state bird of Pennsylvania.

"STOP" LIGHTS FOR FISH

(Continuing from page 475)

first were last to regain the use of their fins and those paralyzed last were the first to recover. The salmon and trout had their own characteristic way of behaving. When the voltage was increased gradually from a very small amount the fish would show signs of feeling it long before they became stunned. They gave short, quick jerks of their tails and fins and moved about rapidly. As the current increased in strength they explored the tank, seeking to avoid the uncomfortable water. Just before reaching the point of being stunned, they dash about wildly—drunk with electricity. When they become paralyzed their fins are motionless and stand out at right angles. They turn over and sink to the bottom where they lie on one side. Sometimes even their gills stop moving.

An electrically stunned fish changes in color, becoming lighter in hue. This is due to the shock administered to the nervous system. When, however, the electricity is turned off, their gills move, their bodies slowly wiggle and turn, and they turn over and move about. Mr. McMillan noted that recovery from electric shock required varying amounts of time, according to the fish. Some needed but a few seconds while others required forty-five minutes or more.

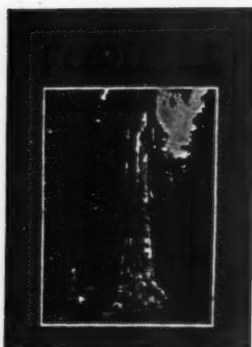
Another odd effect was noted in the use of electricity in the experimental tank. High-frequency electricity had but little effect upon salmon and trout. This, it was supposed, was due to the fact that such current flowed upon the surface of the water and the fish were generally below its strength.

After these experiments Mr. McMillan applied his methods in the waters about the Bonneville Hatchery, in Oregon. With electrodes in the water across the mouths of irrigation ditches where traffic to fish was to be closed, he turned on twenty-four volts. Almost instantly fish avoided this water. The traffic signal was against them.

With 2,000 chinook-salmon fingerlings swimming about he saw them turn away when coming within a foot of the charged water. With twelve rainbow trout the same thing happened. An odd thing occurred that helped him know that his method was correct. The fish were feeding on beetles which frequently drifted

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into the electrified waters. Would the salmon pursue them past the traffic signals? They would not.

Mr. McMillan thought that perhaps the beetles were not enough of a temptation, so he tried throwing a mixture of ground salmon and salmon eggs into the water. This is a favorite food for these fish and whenever it came outside of the signals they would dash for it with great eagerness. Not once, however, could they be tempted to go within the range of the electrodes.

It is believed that this method will save thousands of fish for food besides ridding the farmers of a serious bit of trouble in caring for the dead fish that are caught when the irrigation streams are turned about and the water soaks into the ground.

In the natural streams where the tests were carried forward under many conditions it was found that whole schools of fish, drifting along with the water and then suddenly coming in contact with the signal devices, would be warned by the leaders, who would in some strange way pass the word back and they would all turn as smoothly as a motor traffic parade upon reaching a curve in the street with the red light before them.

EXPLORING THE STREAMS OF WEST VIRGINIA

(Continued from page 469)

stone and hard water. Thereafter we had a different fauna—a richer fauna—and in general, cleaner streams. Camps at Athens, White Sulphur Springs and Marlinton were all in the Kanawha drainage. Wonderful collecting was had in the Bluestone, New and Greenbrier Rivers, while at Marlinton we made a side trip up to the Cranberry Glades, on the western shoulder of the mountain at 3,600 feet elevation. This is a hanging sphagnum bog of several square miles that sprawls over the slope at the head of the westward-flowing Cranberry River. It is a deep bed of sphagnum overspread here and there with mats of other mosses, ferns and lichens, dotted with orchids and other interesting plants and set about with fringes of black spruce. It is a unique situation of small commercial value that should be made a state wild-life preserve.

Then we passed over into the Potomac River drainage, with our camp on Hermit Island in the midst of the wildest of mountain scenery. This was the best camp of all. Here was a clear and sparkling mountain stream flowing through unspoiled woods. The life of the stream was rich and of abounding variety. Near to the camp were a number of unexploited caverns.

We moved on to Wardensville and saw Lost River descending into the earth to pass under a mountain, and reappear as a great upwelling spring miles away on the other side, where it is renamed the Cacapon River. It is another place of clean waters, green woods and charming scenery.

The two remaining camps were on the higher ridges at Elk Garden and Terra Alta. In the former we looked down upon the North Branch of the Potomac River. It stands in sad contrast with the South Branch. Once it was just as fine; but now coal mines pour their sulphur water into it and its native life is gone, annihilated. Its cobblestones are yellow with a coating of sulphur residues. They have no drapings of green or brown algae, and among them no life stirs.

Two little affluents of the North Branch that we visited, Abram's Creek and Stony Creek, were clean and populous; and in a brook that enters the former near its mouth, a

brook known by the unusual name of Johnny Cake Run, we made one of the most interesting finds of the summer. It was a little hard-shelled mayfly larva of the rare genus *Baetisca*—a genus discovered and written about on two continents sixty years ago, and scarcely heard of since.

At Terra Alta we had an opportunity to do a little lake collecting, but not from a normal lake. It is hardly more than a dilatation of a mountain stream formed behind a dam. The state abounds in streams but has no natural lakes.

All about the state we traveled on good roads; for now there are plenty of them, and good schools as well. School people helped us in many ways. Everywhere there was a lively interest in our work. Another generation is growing up in the schools, and is being instructed in the value of natural resources and in means for their preservation. The wasteful exploitation of the past cannot continue in the face of the enlightenment the schools are bringing. The trees will grow again, and when the coal and the oil are gone and pollution is stopped, the streams will again run clear and be repopulated.

Thus we saw West Virginia. We gathered thousands of specimens, accounts of which will appear in scientific papers for decades to come—specimens of plants ranging from oaks to algae; specimens of animals ranging from snakes to sponges, and we saw life in action every day. It is more intriguing than life in the laboratory, more informing as to roles and as to functions in natural society.

In the outdoors nothing lives unto itself alone. The life of the streams is determined by the condition of the hills that shut them in and feed them. In an unspoiled, natural environment two things go always together, clean waters and green woods.

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Approximately 100,000 acres have been burned over in the 1,267 forest fires in Michigan so far this season, according to an estimate made by the Michigan Department of Conservation.

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"WHO'S WHO" AMONG OUR AUTHORS



J. S. Dixon.

and a forestry student at the University of California.

WILSON COMPTON (*The Lumber Industry Stands at Bay*) is secretary and manager of the National Lumber Manufacturers Association. Lawyer and economist, he has distinguished himself among the most thoroughly informed and practical minded authorities on the problems underlying national resource conservation of the industries dependent upon them and particularly the forest products industries. It was Mr. Compton who presented to the President's Timber Conservation Board the problems of the lumber industry as they are today.



W. R. Chapline.

Mr. Chapline has contributed numerous articles on forestry, lands and grazing.

JAMES G. NEEDHAM (*Exploring the Streams of West Virginia*), naturalist and entomologist at Cornell University, at Ithaca, New York, where he received the degree of Ph.D. in 1898. Dr. Needham was at one time instructor of biology at Knox College, professor of biology at Lake Forest University, and professor of entomology at Cornell. Last year he was awarded the King gold medal for the best work on the fauna of China.



F. A. MacDougall.

the Algonquin District in 1923.

JOSEPH S. DIXON (*Save the Trumpeter Swan*) is at present engaged in a survey of animal problems in the National Parks. His title is that of Economic Mammalogist at the University of California. He is a graduate of Throop Polytechnic Institute, at Pasadena, California, and has been a student of zoology at Stanford University

H. J. LUTZ (*Maiden Hair Tree*) is with the Department of Forestry at the Pennsylvania State College, where he holds the position of assistant professor of forestry. Mr. Lutz served several years with the United States Forest Service in various parts of the West and Alaska. He is a graduate of Michigan State College at Lansing.



H. J. Lutz.

R. KENT BEATTIE (*The Dutch Elm Disease*) is the principal pathologist of the United States Department of Agriculture. He has held the positions of forest pathologist, pathological inspector with the Federal Horticultural Board, and pathologist in charge of foreign plant quarantines. He has held professorships in several colleges.

HARRY POLLARD (*A Railroad Wars on Fire*) is with the Southern Pacific Railroad Company which organization he has served since 1897. He makes his home in San Francisco, California.

WINTON WEYDEMAYER (*Flower of Unknown Quantity*) says that while farming for a living he has time to study and enjoy the flora and fauna of Montana, and claims to have become an irrefragable climber and lover of the Rockies.



Winton Weydemeyer.

IRA N. GABRIELSON (*Pothole Trout*) is regional supervisor for the Biological Survey of the Pacific Coast District at Portland, Oregon.

W. C. McCORMICK (*The Three Million*) directed the activities of the Southern Educational Project for The American Forestry Association in the South.

WAKELIN MCNEEL (*A Forest Page for Boys and Girls*) again brings to the boy and girl readers workable and interesting forestry knowledge.

FRED H. KISER (*Through the Lens*) gives more beautiful pictures and tells how to get them.

J. J. MORRIS (*As a Cook Sees the Fire Line*) makes his home in Bendon, Oregon.

JAMES HAY, JR. (*The Smartest Thing My Dog Ever Did*), is a newspaper man and author. He traveled with President Taft from his nomination until 1910, since which time he has been a free-lance writer. He has written and published two novels and six book length mystery tales and numerous articles. He is a resident of Washington, D. C.



James Hay, Jr.

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Member A. B. C.

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